Emotional experience in store environment: adaptive theoretical framework and its application for store design

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Emotional experience in store environment: Adaptive theoretical framework and its application for store design

by

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This is to certify that the master's thesis of

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ABSTRACT

Due to the expansion of alternative selling channels, such as television and the Internet, an attractive store image and positive emotional experience in on-site stores have been becoming more critical to their success as retail environments. This concern is shared among designers and marketers. Several studies show that the emotional shopping experience influences consumers’ purchasing behaviors. However, there is a lack of research on the interaction between the in-store environment and human emotion.

The purpose of this thesis is to propose a framework that can explain the relationship between store environments and consumers’ emotional responses. It can be used as a guideline for store designers and marketers in the creation of an effective store design. This framework is developed from the Mehrabian-Russell model, Berlyne’s aesthetic theory, and the Kaplan and Kaplan theory.

Using a grounded theory approach, a critical analysis of existing theories resulted in the integration of new interpretations. “Pleasure” and “arousal” are conceptualized as emotional dimensions and the interaction is identified as an inverted-U shape of function of arousal under the condition of pleasure. Environmental stimuli are presented in relation to the emotional dimensions, while six arousal control devices are introduced for controlling the environmental stimuli.

The proposed framework is applied as a case study in an actual design process for the Octagon Shop, located in downtown Ames, Iowa. The design analysis and development are conducted and followed by the proposed framework. The design results reveal the potential use for the framework, not only for in-store retail environments, but also in broader design applications.
CHAPTER 1. INTRODUCTION

One of the most significant features of the total product is the place where it is bought or consumed. ... In some cases, the atmosphere is the primary product (Kotler, 1974, pg. 48).

Problem Statement

Visits to the Mall of America, the stores on 5th Avenue in New York, Madison Avenue in Chicago, Rainforest Café, or ESPN Zone are frequently on do-it-lists when people travel. Why do people prefer to visit such places? Is it because they need to purchase a particular product, know they will be hungry, or think those places must be attractive and fun? Why do people prefer shopping in Target to shopping in Wal-Mart, or why do people prefer shopping malls to downtown strip stores? These must be common questions among storeowners, marketers, and store designers. One might say that a store environment, where consumers interact, should be functionally effective and visually attractive to the consumers, and should reinforce positive in-store experiences of consumers.

Because of these concerns, storeowners invest vast amounts of money to refurbish their store environments, and researchers put their effort into studying the effects of store environment on consumer behaviors. Thus, the notion that attractive store image and positive shopping experience are critical has been shared among designers and marketers. In other words, emotional responses of consumers might influence consumers' purchasing behavior and decision-making processes (Donovan, Rossiter, & Nesdale, 1994; Kotler, 1974; Spies, Hesse, & Loesch, 1997). Furthermore, the shopping experience is getting more important in a store environment due to expansion of convenient
dot-com businesses commoditizing products and services (Pine, Gilmore, & NetLibrary Inc., 1999). Therefore, this thesis starts with the question: What kinds of environmental characteristics affect consumers within a store environment?

In the design fields, such as landscape architecture, architecture, and interior design, many studies of environment-behavior relationships have been undertaken by psychologists; consequently, environmental psychology has become a rapidly growing discipline (Donovan & Rossiter, 1982). Most studies are focused on work environments, residential environments, or institutional environments rather than store environments (Donovan & Rossiter, 1982; Mehrabian, 1976). However, there is a surprising lack of research on store environment in design studies (Baker, Levy, & Grewal, 1992; Bitner, 1986; Donovan & Rossiter, 1982; Gardner & Siomkos, 1986; Kotler, 1974). More surprisingly, little attention has been focused on research of environment-behavior relationship in a retail store environment, especially in interior design academic fields. Moreover, this research on effects of a store environment from an environmental psychology approach has been mostly conducted by marketers such as Kotler (1974), Donovan and John (1992), Spies et al. (1997), Bitner (1986), and Baker et al.

It might be interesting to note the causes of the lack of academic research in design studies as assessed by Christopher Arnold (1986, pg. 94-95):

Study of the retail and service environment, central though it is to American life, did not form a focus of this academic revolution. The reasons are not far to seek:

- Relative to the social ideals of the movement, the commercial world was seen as too crass to justify attention.
- No research money was available, whereas government agencies such as the Department of Housing and Development, or the National Institute of
Since the appearance of the new profession of store planning and design in the 1950’s, five decades have passed (Israel, 1994). This might be another reason why the history and theories of store planning and design are relatively brief in the design field.

However, no one should ignore the fact that store design or retail design education in an interior design program is an important part of design curricula. In fact, store design, or commercial design, has led interior design trends in general. One reason is that retail design is one of the most prosperous businesses in the interior design field. According to American Society of Interior Designers, ASID, over fifty percent of members deal with commercial spaces (ASID, 2001). One might expect that there would be several guidelines or theories on Retail Design for practitioners and design students. Although references do exist on store design, most of the contexts are purely anecdotal and are mainly physical guidelines of design processes and methods written by retail design specialists.

Barr and Broudy (1986) state that “today’s retailing territory for designers combines a grasp of the psychology of selling, a feeling for the excitement of the market place, and a working knowledge of merchandising distribution channels. The design and signature look of a retail store reflect the owner’s merchandising philosophy, so it is essential that the planner-designer have a sharp perspective on top management’s thinking. Just because a retailer opens a store, erects a sign, and sells good products, there is no guarantee that sufficient customers will come in to return a profit on
operation.” Indeed, one of stronger influences of the store designer in design fields, as a bridge of Art and Science, is artistic sensibility and creativity. Beyond that, the knowledge of merchandising and marketing can enhance the marketability of designers. The problem is that, in most cases, the final compositions of environmental elements tend to be evaluated by storeowners. Moreover, most creative works in design process are fairly intuitive and subjective, depending on designers’ viewpoints. In other words, there is a possibility that the store design might be idiosyncratic, depending on the sensibilities of decision-makers, designers or storeowners, rather than on those of consumers. Therefore, there are no guarantees that the store environment can draw customers’ attention and enhance positive shopping experiences.

It is true that the intuitive approach is a critical part of the design process; but designers should at least, be aware of environmental characteristics affecting consumer behavior. To do so, a general framework is necessary to guide designers to create memorable space where they can predict emotional responses of consumers. Therefore, academic research studies that form a bridge between interior design and business, regarding store environment, are necessary for both practitioners and students.
Theoretical Background

Research of store design might be appropriate for research on human behavior. The reasons are: first, predictability is crucial in designing a store as a part of marketing strategies; second, the consumer target is focused on a homogeneous group: certain gender or age groups and customer group based on certain lifestyle trends are example of homogeneous market segmentation. Therefore, environmental stimuli can induce certain interactions of consumers and the interactions or perceptions can be predictable. However, inexplicably, few studies conducting research on environmental stimuli affecting human responses as a framework has been found in interior design field.

Interestingly, the notion that consumer behavior, or purchasing patterns can be affected by physical environments has been pointed out by business researchers since Kotler (1974) introduced “atmospherics”. Kotler (1974) introduced the concept of “atmospherics” asserting that the store atmosphere is an important attribute affecting consumers’ attitudes toward store experience. This has been supported by researchers such as Clarke and Schmidt (1995), and Spies (1997). Kotler (1974) also states that the role of “atmospherics” induced by environmental stimuli enhances positive shopping experience and leads to positive store attributes. These atmospherics encourage consumers to revisit the place, prolong shopping time (which induces likelihood of profitability) and reinforce positive store images. McDonnell (2000a) found that people interact with environmental design changes, not with product. Also, he found that there is a certain change of flow of movement when consumers encounter new design attributes or “obstacles”. The influences of atmospherics in a store environment are supported by empirical studies.
Sharma and Stafford (2000) found that, at least, in the prestigious store environment, store atmospherics is used as the primary evaluative attribute by consumers, and “store ambience and design positively affect customers’ persuasion as well as customers’ positive perceptions of salespeople (pg. 183).” The research on effects of scent and music by Mattila and Wirtz shows that positive store atmospherics, in this case, congruency of scent and music, positively relates with positive evaluation on the environment, higher levels of approach and impulse buying behaviors, and positive shopping experience (Mattila & Wirtz, 2001). Spies et al. (1997) provide strong evidence of effects of store atmospherics in their empirical study by comparison of same brand stores. They found that the pleasant store environment induces greater satisfaction and positive customers’ mood, and the consumers spontaneously spent more money on well-displayed products that they liked.

The most common theoretical model of these retail business researches on consumer behaviors affected by physical environments is Mehrabian-Russell model (M-R model). This model demonstrates a framework that can explain and predict emotional responses of people in the environmental settings. Donovan and John (1982), and Donovan et al. (1994) indicate that the M-R model is a promising model for studying consumer behavior within retail environments by testing the model. Also, they indicate that by using a Stimulus-Organism-Response (S-O-R) paradigm, the model offers a prudent description of environments, intervening variables, and behaviors relevant to the retail setting. However, this model does not account for environmental stimuli affecting emotional responses. Although previous business research provides environmental stimuli information, the studies were conducted with few stimuli at a time in academic research with little realistic option availability (Eroblu & Machleit, 1993).
Therefore, it is valuable to research environmental stimuli affecting consumer behaviors and responding to the M-R model and to apply the findings in a retail design process. Thus, proposing a framework that can explain relationships between stimulus and organism might draw researchers' attention to store design in interior design fields as well. To do so, this thesis is based on the following assumptions:

1. The emotional experience can be predictable in store environmental settings, and positive emotional responses are important for enhancing profits.

2. Environmental characteristics can induce and control certain emotional responses.

3. Although a design development is subjective, a framework exists, at least as a starting point to guide designers to create predictable space.

4. The M-R model is a promising theory for the research on environment-consumer behaviors.
Purpose Statement

The purpose of this study is as follows:

1. To propose a theoretical framework responding to the M-R model so that not only can designers and students *efficiently* create attractive store environments for the intended consumers, but they can also suggest new insight in research fields to scholars in interior design research.

2. To analyze an existing store environment, The Octagon Shop located in the downtown of Ames, Iowa as a case study based on the proposed framework.

3. To apply the findings of this study in a store design process and to propose design solutions for an intended store environment, The Octagon Shop, using the suggested framework.

4. To simulate the *proposed* environment by a computer aided method, as a critical method of presentation and further research.
Organization of the Document

This thesis is divided into six chapters. In Chapter 1, the problem of lack of retail design research in the interior design field, the research theoretical background, and finally, the purpose of this study will be addressed. Literature reviews will be presented in Chapter 2, which contains four major areas: a set of empirical studies on environment-behavior issues in retail business, the M-R model, other existing theories related to the M-R model, and theoretical frameworks on environmental characteristics by business researchers. Basic organization of this chapter follows the framework of the M-R model proposed by Mehrabian and Russell. Chapter 3 will present the methods utilized in this study and its theoretical background. The analysis of reviewed theories will be presented and the integration of theories will be attempted in Chapter 4. Finally, the adaptive theoretical framework being proposed in this thesis will be presented in Chapter 5. In Chapter 6, the framework will be applied to an actual design process as a case study. The icons of “glass box approach” and “black box approach” will be used in the design process to find out whether the framework can be positively involved in design development. Finally, in Chapters 7, summary and conclusion of this study will be discussed in addition to suggestions for further research.
CHAPTER 2. LITERATURE REVIEW

The Service Economy is peaking. A new, emerging economy is coming to the fore, one based on a distinct kind of economic output. Goods and services are no longer enough (Pine et al., 1999).

This chapter focuses on the environment-perception relationship in physical shopping environments and is organized by four major areas: first, importance of shopping experience and its relation to physical environment; second, the Mehrabian – Russell model focusing on the store environment with empirical studies of this issue and on environmental aspects; third, other environmental psychology theories related to the M-R model; and finally, existing frameworks on typology of environmental stimuli in a store environment.

Unfortunately, most of the academic research has been found in business and environment psychology areas, and there is lack of research conducted in academic interior design. However, review of existing theory or literature on store planning in the interior design field will be presented in each area.

Experience in a Shopping Environment

The shopping environment is commonly known as the place or space where people buy goods and, in a broader sense, it includes intangible products and services (Barr & Broudy, 1986; Falk & Campbell, 1997). Also, the concept of shopping is broadly known as “consumption-oriented
movement in a space where one has the possibility of making purchases” (Lehtonen & Maenpaa, 1997, p. 143). The central idea of these definitions is associated with the concept of commodities. In other words, assessment, or preference of products or services, is associated with evaluation of value-oriented judgments made mainly by comparing price and quality.

The commodity takes a central place in consumer studies as well. Consumer behaviors and perceptions while shopping are mainly value-based evaluations of products. From these notions, the consumer in a store environment often has strong intentions of purchasing products. The fact that consumers have more access to many retail channels such as Internet shopping, catalogues, television’s Home Shopping Channel, etc., is significant. Consumers must decide which products are cheaper and more convenient, and when purchasing what they need and want.

Lehtonen and Maenpaa (1997) state that shopping has two values, from the consumer’s viewpoint: first, hedonic or pleasure value, and second, utilitarian value or necessary value (see table 2-1). This concept is shared among other researchers such as Baker; Babin, Darden, and Griffin; Pessemier; and Martineau (Wakefield & Baker, 1998).

Hedonic shopping value consists of recreational activities in shopping; these activities are not necessarily associated with buying intentions. For people who have this shopping intention, the quality of the shopping experience is an important aspect. The shopping place is just “the place to go for fun,” for their day-dreaming, or for the planning of future purchases (Lehtonen & Maenpaa, 1997; Mehrabian, 1976; Wakefield & Baker, 1998). Also, within the shopping process, the hedonic and utilitarian value can be spontaneously switched.
Table 2-1. Shopping: Pleasure versus Necessity (Lehtonen & Maenpaa, 1997, p. 144)

<table>
<thead>
<tr>
<th>Shopping as a pleasurable social form</th>
<th>Shopping as a necessary maintenance activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spending of time</td>
<td>Scarcity of time</td>
</tr>
<tr>
<td>An end in itself</td>
<td>A means</td>
</tr>
<tr>
<td>Does not necessarily imply making purchases</td>
<td>Always implies making purchases</td>
</tr>
<tr>
<td>Impulsiveness</td>
<td>Planning</td>
</tr>
<tr>
<td>Dreaminess and self-illusory hedonism</td>
<td>Realistic satisfaction of needs</td>
</tr>
<tr>
<td>Effectiveness unimportant</td>
<td>As effective as possible</td>
</tr>
<tr>
<td>Pleasure</td>
<td>Necessity</td>
</tr>
<tr>
<td>Outside the routines of the everyday</td>
<td>An everyday routine among others</td>
</tr>
<tr>
<td>Emphasis on experience</td>
<td>Emphasis on rationality</td>
</tr>
<tr>
<td>Playfulness</td>
<td>Seriousness</td>
</tr>
</tbody>
</table>

Pleasurable experiences of consumers are getting more important while consumer markets are getting more and more competitive, especially with the expansion of e-businesses. Pine and Gilmore emphasize the importance of “experience” in business fields within their book, The Experience Economy. Pine et al. (1999) claim that current business should shift to the new economy situation, so called “Experience Economy.” According to them, the retail environments offering physical goods and services have been commoditized, and Internet Shopping rapidly expands this commoditization. Now the current markets will encounter a new economy force:

Experiences are a fourth economic offering, as distinct from services as services are from goods, but one that has until now gone largely unrecognized. Experiences have always been around, but consumers, businesses, and economists lumped them into the service sector along with such uneventful activities as dry cleaning, auto repair, wholesale distribution, and telephone access. When a person buys a service, he purchases a set of intangible activities carried out on his behalf. But when he buys an experience, he pays to spend time enjoying a series of memorable events that a company stages—as in a theatrical play—to engage him in a personal way (Pine et al., 1999, pg. 2).
McDonnell supports the importance of spatial experience by comparing it to e-commerce. He states, “It is critical for operators to learn how to translate the language of stores if they are to successfully compete in an ever-encroaching e-business world. Image and experience are not well duplicated on the web. The web sells items very well. Brick and mortar sells image and experience” (McDonnell, 2000b). These realities form the notion that positive shopping experience in a physical retail environment is getting more important in more competitive market situations.

According to Lehtonen and Maenpaa (1997), hedonic, or pleasant shopping experience, has a close relationship with tourism. They state that the central appeal of the two concepts is “the experience of movement and the special relationship with the environment... (t)hey [shoppers] have an aesthetic relation to their environment, and the core of their pleasure is the encounter with the new and the exotic, and the attempt to assimilate it in terms of what is known and familiar” (Lehtonen & Maenpaa, 1997, p. 147).

The notion that the spatial and hedonic experience takes an important role in business has already emerged in the retail environment. The terms destination, interactive, or experiential design are broadly recognized among practitioners. Currimbhoy (2000) states that the aim of “experiential design” is to effect an emotion or series of emotions rather than to just create retail space in contrast to traditional design. Currimbhoy notes that, “Disney, Nike, FAO Schwarz and Universal Studios, among others, are offering a variety of experience-enriching activities in their megastores. Malls, and even smaller stores, offer movies, games, light and sound shows, and other interactive amusements... cosmetics stores have become mini-spas, some health food shops include an herb garden, and a walk across a mall can become a passage to India ”(Currimbhoy, 2000, p. 26).
In other research, Kotler (1974) claims that the physical environment itself is a primary product in a store setting; indeed, positive spatial experience should be enhanced in a retail environment whether or not it sells goods or services.

In GlobalShop 1999, the world’s largest annual design exposition, interactive shopping experiences were identified as the central focus in store planning among the top 10 trends in retailing (Take Note, 1999). For example, the use of interactive technology, lighting techniques, multidimensional storefronts, elements of entertainment, and growth in the marketing of lifestyle products reflect the market shift toward “Experience Economy.”

**Atmospherics**

The term “atmospherics” (Kotler, 1974) has been recognized by marketers as environmental characteristics effecting consumer behavior in consumption settings. Kotler claims that “atmospherics” should be utilized “to describe the conscious designing of space to create certain effects in buyers. More specifically, atmospherics is the effort to design buying environments to produce specific emotional effects in the buyer that enhance his purchase probability” (Kotler, 1974, p. 50). According to Kotler, atmospherics can have an effect on purchase behavior in three different ways: as a message-creating medium, attention-creating medium, and affect-creating medium:

**Message-creating medium:** expression of vendors to establish their image and goal to potential and actual consumers

**Attention-creating medium:** establishment capturing consumers’ attention among other competitors

**Affect-creating medium:** establishment of consumers’ positive emotional reaction contributing favorably to purchase probability
The evidence that atmospherics directly and indirectly induce profitability of a store has been established by a number of empirical studies. For instance, articles displayed in attractive ways are more spontaneously purchased in a present store setting (Donovan et al., 1994; Spies et al., 1997).

Spies et al. (1997) studied effects of store atmospherics on mood and purchasing behavior by comparing two same brand furniture stores. They found that store atmosphere directly affected customers' mood and the enhanced mood induced consumer satisfaction and spending. Atmosphere also directly affected satisfaction, which was greater in the pleasant store than in the less pleasant store (see figure 2-1).
Good store atmosphere influences the amount of time spent in the store (Donovan & Rossiter, 1982; Donovan et al., 1994; Spies et al., 1997; Wakefield & Baker, 1998), and willingness to revisit the store (Donovan & Rossiter, 1982). Also, Baker and Parasuraman (1994) found that the store environment, or physical store characteristics, directly influences consumers’ perception of merchandise and service quality and are antecedents of store image. Moreover, the physical store characteristics influence consumers’ positive perceptions of salespeople as well (Sharma & Stafford, 2000).

**Emotion vs. Cognition**

The definition of “emotion,” generally known as “subject feelings elicited by external stimuli (Leventhal, 1984),” is difficult to discuss because the concept of emotion is fuzzy, and emotional responses are difficult to observe. Basically, there are two arguments about emotion.

First, from a cognitive theorist’s standpoint, it is believed that emotion is the result of cognitive processes or appraisal (Lazarus, 1982; Lazarus, Coyne, & Folkman, 1984). Lazarus (1982) claims that cognitive activity is crucial in emotional responses and “... its role is to mediate the relationship between the person and the environment. The appraisal process gives rise to a particular emotion with greater or lesser intensity depending on how the relationship is evaluated with respect to the person’s well being”. He also states, “Cognition and Emotion are usually fused in nature” and that extreme, even purely emotional reactions, are results of cognitive process. For instance, avoidance without fear or attack without anger can occur due to loose or abnormal linkage between feeling and thought.
On the other hand, other theorists, such as Zajonc and Plutchik, believe that emotion and cognition are separate and can be independent entities. In other words, emotion can occur without cognitive appraisal (Plutchik, 1984; Zajonc, 1984a). Zajonc argues, “The question of affective primacy must be settled on empirical grounds. If one insists that cognitive appraisal is always a precondition to emotion, one is forced to allow cognition to be reduced to such minimal processes as the firing of the retinal cells. Thus, if we accept Lazarus’s position, all distinctions between cognition, perception, and sensation disappear” (Zajonc, 1984b, pg. 267).

According to Leventhal (1984), “Zajonc (1980) has argued that preferences, or emotionally based choices, occur independent of inferences or cognitively based recognition or reasoning”. For instance, Although recognition or reasoning is known as a familiar concept among cognition-oriented theorists, Zajonc (1984a), asserts that “neither objective recognition nor subjective impression of recognition are necessary for the exposure effect, and that liking for a stimulus object can be enhanced by virtue of repeated exposure alone, independently of whether the subject is able or unable to recognize as familiar” (p. 239).

This seems an important argument for this study because, according to Leventhal (1984), if cognition is understood as conscious thinking, Zajonc’s theory of independence of emotion is sensible, and the cognition in marketing is treated as an intellectual and conscious concept. Also, it seems that the M-R model tends toward this direction.

According to Mehrabian (1980, pg. xviii), “Emotions are ever present in human functioning and constitute the precognitive or rudimentary aspects of cognitive response to situations, events and persons. An individual’s emotional state has important implications for preferences of places and
In environmental psychology, experience has, according to Tuan (1977), two basic components: thought and emotion; these two components coincide in human experience. For instance, sensation, as a result of maximized emotional experience, is achieved by unexpected experience based on existing memory and anticipation. Figure 2-2 indicates Tuan’s concept of human experience. Also, he states that experience has both passive and active meanings: “Experience has a connotation of passivity; the word suggests what a person has undergone or suffered... Experience thus implies the ability to learn from what one has undergone. To experience is to learn; it means acting on the given and creating out of the given... (t)o experience in the active sense requires that one venture forth into the unfamiliar and experiment with the elusive and the uncertain”.

![Diagram of Experience Components](image)

**Figure 2-2. Components of Experience (Tuan, 1977, pg. 8)**

Bitner (1992) states that cognitive or emotional responses of consumers may be elicited. In this case, the concept of thought refers to cognition in a store environment: cognitive perception influences beliefs, categorization, and symbolic meaning. For example, consumers’ belief in service quality or merchandising quality is induced by cognitive perception. Informational and environmental
cues that enable consumers to define certain business categories involve the cognitive process, such as distinguishing between high-end fashion shops versus discount stores. Signage and display in a store also influence cognition level and are related to information rate (Buckley, 1984). Also it is important to note that emotional responses to store behaviors are independent of cognitive variables (Donovan & Rossiter, 1982; Donovan et al., 1994).

**Sensory Experience**

According to Tuan, “Experience is a cover-all term for the various modes through which a person knows and constructs a reality. These modes range from the more direct and passive senses of smell, taste, and touch, to active visual perception and the indirect mode of symbolization” (Tuan, 1977, pg. 8).

In business, Pine et al. (1999) emphasize sensible experiences in retail settings to achieve more memorable times for consumers. The sensory experience is not necessarily the direct result of products or service. For example, “Smart shoeshine operators augment the smell of polish with crisp snaps of the cloth, scents and sounds that don't make the shoes any shinier but do make the experience more engaging” (Pine et al., 1999, pg.59). By evoking sensory experiences, the likelihood of consumers spending more time is increased, which could affect likelihood of store productivity as well.

Touch is an important sense of spatial experience (Bloomer & Moore, 1977; Tuan, 1977) as is sight. These two senses are directly associated with three-dimensional experiences. Ability of movement, “the haptic sense” (Bloomer & Moore, 1977), or “kinesthesia” (Tuan, 1977) not only
enables us to have strong spatial and directional feeling; also, it allows us to have physical contacts between environments and the human body.

It is also important to note that “Taste, smell, skin sensitivity, and hearing cannot individually (nor perhaps even together) make us aware of a spacious external world inhabited by objects. In combination with, the ‘spatializing’ faculties of sight and touch, however, these essentially nondistancing senses greatly enrich our appreciation of the world’s spatial and geometrical character” (Tuan, 1977, pg. 12).

**Mehrabian-Russell Model**

The Mehrabian-Russell model, known as M-R model, is proposed as a theoretical framework that explains immediate emotional states elicited by environmental stimuli and influences on human behaviors. Marketers studying environmental affect, so called “atmospherics or servicescapes,” on consumer behavior commonly utilize this model.

According to this model, three basic combinations of emotional dimensions - pleasure, arousal, and dominance (PAD) - represent emotional states (Mehrabian, 1976, 1980; Mehrabian & Russell, 1974) and are mediators of human behavior. In other words, human feeling can be explained by the three dimensions, PAD, and human behaviors can be predicted by the framework. Figure 2-3 indicates the general paradigm of M-R model.
This theory is important because of the possibility of applying it in a store setting. Mahrabian indicates its potential; he considers shopping environments as fun places, like fairs or bazaars, citing shopping environments as sources of excitement and pleasure (Mehrabian, 1976). He believes that the combination of high arousal level and high pleasure level can enhance feelings of excitement. He also states, “Dominance is enhanced by a feeling that you can look anywhere, rummage around, and handle everything. If you know what you want and can distinguish a real bargain, the store is a high-load environment in which to explore and have fun” (Mehrabian, 1976). Other external variables, such as information seeking tendencies, social acceptance, and informational cues might allow people to explore with enhancing the dominance level, which is a feeling state of a person who feels in control of a situation (Mehrabian, 1976).

Figure 2-3. Outline of the M-R Model (Mehrabian & Russell, 1974, pg. 8)
The M-R model has been tested and supported by many researchers in the marketing area. Donovan & Rossiter (1982) and Donovan et al. (1994) conducted their studies by focusing on this M-R theory directly. They tested the theory within actual store environments and found that the M-R model is a promising framework to predict in-store shopping behaviors. Two dimensions, arousal and pleasure, are more directly associated with effects on consumer behavior. Donovan et al. (1994) found that "shoppers' emotional states within the store lead actual purchase behavior – not just attitudes or intentions. Moreover, the contribution of the emotional variables to store behavior is independent of cognitive variables such as perceptions of quality and price" (Donovan et al., 1994, pg. 291).

The study conducted by Baker et al. also supports Donovan and Rossiter's finding that "the Mehrabian-Russell model is applicable to a retail setting: affective states produced by the store environment do influence consumers' willingness to buy" (Baker et al., 1992, pg.457).

Three Basic Emotional Dimensions

According to Mehrabian and Russell (1974), pleasure, arousal, and dominance (PAD) are rudimentary dimensions of the emotional state of a person elicited by environmental stimuli. These three basic emotional states take into account such mediators of human behaviors as verbal and non-verbal expressions of preference, physical approach, affiliation, exploration, and performance.

These dimensions can meet the requirements to be fundamental dimensions of human interaction in all kinds of environmental situations. First, all the immediate responses of stimulation in all environments can be identified by PAD. Second, this three dimensional framework can explain
various aspects of personalities and social differences. Finally, these emotional states can “not only constitute the base for elementary cognitive judgments in all situations, but have direct bearing on many other facets of intra- and inter-individual functioning” (Mehrabian, 1980, pg. 4).

**Pleasure**

Pleasure-displeasure can be defined as the degree of feeling, such as good, happy, joyful, or satisfied in a situation (Baker et al., 1992; Donovan & Rossiter, 1982; Donovan et al., 1994; Mehrabian, 1980; Mehrabian & Russell, 1974). These responses of pleasure “can be assessed readily with semantic differential measures or with behavioral indicators such as smiles, laughter, and in general, positive versus negative facial expressions” (Mehrabian, 1980, pg. 15). In the M-R model, the determination of pleasure is assessed by testing verbal expression of the subjects’ emotional state; the pairs of adjectives referring to pleasure are happy-unhappy, pleases-annoyed, satisfied-unsatisfied, contented-melancholic, hopeful-despairing, and relaxed-bored.

The concept of pleasure in the M-R model is a pure emotional response to environmental stimuli, excluding cognitive judgments. Mehrabian and Russell (1974) indicate that the concept of “pleasure” should be distinguished from the concept of “preference,” which is one aspect of approach-avoidance behavior elicited by three emotional states. Preference is not limited to the pleasant stimulus itself; however, the pleasure-displeasure level is correlated with approach-avoidance.
**Arousal**

The concept of "arousal-nonarousal" is defined as a feeling state between sleepiness and fantastic excitement (Bell, Greene, Fisher, & Baum, 2001; Mehrabian, 1980; Mehrabian & Russell, 1974). The arousal level can be usually measured by physiological changes such as increased heart rate, blood pressure, respiration rate, or motor activities. In the M-R model, the dimension of arousal is mainly measured by semantic assessments.

According to the M-R model, the dimension of arousal is elicited by a combination of activity and alertness (Mehrabian, 1980). For instance, the lowest arousal level might be the situation in which a healthy person is totally asleep (low activities and low alertness). "A moderately high state of arousal may involve very high alertness but little activity (e.g., someone solving a very complex mathematical problem) or high activity and low alertness (e.g., a jogger who is daydreaming)" (Mehrabian, 1976, pg. 16). High arousal level might even involve both high alertness and high activities.

The characteristic of the environmental stimuli affecting arousal level refers to "information rate" involving complexity, novelty, surprise, or randomness of external stimuli. The M-R model indicates that arousal is also determined by internal sources of subjects such as physiological changes due to alcohol or drug usage, or level of anxiety (Mehrabian, 1980; Mehrabian & Russell, 1974). In other words, arousal level of emotional response is co-related to physical, cultural, or emotional precondition of individuals. For example, the elicited arousal level between a rural area in an Asian country and a metropolitan area in a western country could differ substantially.
Information Rate

Information rate in the M-R model is hypothesized to directly correlate with arousal level and is associated with sense modalities. The model defines information rate as the load of an environment. “A high-load environment (i.e., novel, surprising, crowded) will make a person feel stimulated, excited, and alert. On the other hand, a low-load environment will result in feelings of calm, relaxation, or even sleepiness” (Donovan & Rossiter, 1982, pg. 40).

Perceived information rate, or average information rate, “is defined simply as the total amount of information per unit time” (Mehrabian & Russell, 1974, pg. 79). The information rate is conceptualized as degrees of perceptions elicited by environmental stimuli such as complex, novel, random, intense, jarring, dissonant, heterogeneous, intermittent, rare, surprising, asymmetrical, close, crowded, meaningless, or dense.

Mehrabian and Russell note that, “All such concepts somehow relate to the idea of information because temporal or spatial patterning serves to increase disproportionately the conditional probabilities of certain components at various parts in an arrangement, thereby reducing uncertainty (i.e., the amount of information)” (Mehrabian & Russell, 1974, pg. 138).

In determining degrees of perception, the concepts of patterning, familiarity and immediacy take central roles. Patterning implies regularity, dependencies, or lawfulness of stimuli being perceived. For complex stimuli, the patterning of forms, or the patterning between colors and temperature, allows subjects to predict the next item in a sequence, thereby increasing conditional probabilities. Therefore, the patterning reduces information rate.
Familiarity is associated with past exposure of a subject to similar characteristics of stimuli. Meaningfulness, surprise, novelty, scale, and expectation are all related to this concept. If a configuration of stimuli is recognizable, conditional probability of the event is increased, and thereby, information rate is reduced.

Immediacy is the concept of distance and changes. In other words, closer stimuli that people can touch, smell, and see are more immediate than its photograph. Movement of stimuli in a sequence or changing scenes in a time unit is also immediate; therefore, information rate is higher than its static stimuli (Mehrabian, 1976; Mehrabian & Russell, 1974). Crowding or density can be described in this concept; “a high densities of persons is expected to involve a much greater information rate than a high density of inanimate objects.

**Dominance**

Dominance-submissive refers to a feeling state where people feel unrestricted, free to act, free to choose, or in control of a situation (Donovan & Rossiter, 1982; Mehrabian, 1976, 1980; Mehrabian & Russell, 1974). According to the M-R model, flexibility, privacy, and territoriality can affect the feeling of dominance. For instance, flexible arrangements of furniture or lighting, reading a book at his/her home rather than in a library, or well-facilitated tools in his/her work place can enhance the feeling of dominance (Mehrabian & Russell, 1974). Mehrabian and Russell also address familiar concepts regarding dominance in social environments by addressing formal and informal social situations.
Mehrabian states that the dominant feeling can be enhanced by shopping experiences in a store environment (Mehrabian, 1976). For example, in an exclusively high-end store environment that is well-organized and un-crowded, people who can afford to spend much money on expensive goods have more dominant feelings, whereas others feel submissive because of financial limitations. Therefore, combinations of heightened pleasure, heightened arousal, and mild feelings of dominance can enhance exciting shopping experiences for maximum buying behaviors (Mehrabian, 1976).

Donovan and Rossiter argue that the emotional state of dominance should be excluded in the M-R model for store environments (Donovan & Rossiter, 1982). The reasons are: first, the measurement of dominance is ambiguous in retail settings; second, dominance requires a cognitive interpretation that is not applicable for the pure emotional states; and dominant feeling might be already achieved when consumers enter the store because of the nature of store environments. Therefore, pleasure and arousal are more adequate dimensions of emotional responses of people in most retail environments, in general. Donovan and Rossiter found a slight negative relationship between dominance and money spent. “The negative sign indicates that a feeling of submissiveness may accompany the anticipation of spending more money than intended” (Donovan & Rossiter, 1982, pg. 51).

**Approach - Avoidance**

Approach-avoidance is a behavioral outcome of emotions induced by environmental stimuli (Donovan & Rossiter, 1982; Donovan et al., 1994; Mehrabian, 1976, 1980; Mehrabian & Russell, 1974; Wakefield & Baker, 1998). According to the M-R model, behavioral reactions of people to all environments fall into the two categories of *approach* and *avoidance* (Mehrabian, 1976). The concept
of approach-avoidance “is defined in a broad sense to include physical movement toward, or away from, an environment or stimulus, degree of attention, exploration, favorable attitudes such as verbally or nonverbally expressed preference or liking, approach to a task (the level of performance), and approach to another person (affiliation)” (Mehrabian & Russell, 1974, pg. 96).

Mehrabian (1980) classifies approach-avoidance behaviors (results of emotional reactions) into three groups: preference, affiliation, and work (performance). In the M-R model, the concept of “liking” is utilized as a super-ordinate concept subsuming variations in preference that are defined as positive-negative attitudes or like-dislike attitudes.

According to Mehrabian (1980), liking is directly correlated to approach-avoidance behavior, and the level of liking can be inferred from the approach-avoidance subsuming, “(1) physical approach versus avoidance, as when we move toward or move away from a person or an object, (2) degree of attending to, and exploration and examination of an entity, as when we pay attention to and explore the statements of another person in contrast to ignoring her or him, and (3) the degree of striving to get close to or away from an entity, as when a bored conference participant turns away from the speaker” (Mehrabian, 1980, pg. 173-174).

This concept of liking is supported by Donovan and Rossiter (1982). They found that simple “affect” representing like or enjoy in a store environment (other than satisfaction induced by cognitive assessments such as price, location, quality of merchandise) has a strong relationship to approach-avoidance behavior in a store environment.
The approach-avoidance behavior associated with the level of liking is very important in studying emotional reactions in store environments. For instance, positive attitude toward, or preference for, can increase time spent so that probability of spending money can be enhanced (Donovan & Rossiter, 1982; Wakefield & Baker, 1998). In this thesis, physical approach and exploration are classified for those behaviors directly correlated with liking, as Donovan and Rossiter (1982) classify. Table 2-2 indicates the four categories of approach-avoidance behaviors and their relationships to a store environment.

Table 2-2. Classification of Approach-Avoidance Behaviors and In-store Relationship (Donovan & Rossiter, 1982, pg. 37)

<table>
<thead>
<tr>
<th>Approach behavior</th>
<th>Description</th>
<th>In-store relationship</th>
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<tbody>
<tr>
<td>Physical approach</td>
<td>A desire to physically stay in</td>
<td>Store patronage intentions</td>
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<tr>
<td>Exploration</td>
<td>A desire to look around</td>
<td>In-store search and exposure to a broad or narrow range of retail offerings</td>
</tr>
<tr>
<td>Performance</td>
<td>The degree of enhancement and satisfaction with task performance</td>
<td>Repeat-shopping frequency as well as reinforcement of time and money expenditures in the store</td>
</tr>
<tr>
<td>Affiliation</td>
<td>A desire to communicate with others</td>
<td>Interaction with sales personnel and floor staff</td>
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</table>

Pleasure-Arousal Interaction and Approach – Avoidance Behavior

The evidence in the M-R model shows that pleasure is a strong determinant of approach-avoidance behaviors, preference, physical approach, desire to explore, and affiliation; this strong relationship is confirmed by Donovan and Rossiter (Donovan & Rossiter, 1982; Mehrabian, 1976; Mehrabian & Russell, 1974). In other words, approach behaviors can be enhanced if the surrounding
environment becomes more pleasant.

Mehrabian and Rossiter (1974) found an exception, noting that the desire for affiliation was unexpectedly high in a highly arousing situation with an unpleasant feeling. However, in this thesis, this exception will be excluded, because as Mehrabian (1976) mentioned, shopping or store environments can be generally considered pleasant environments.

Arousal is an important emotional factor in determining approach-avoidance behavior in the M-R model; it conditionally interacts with pleasure. For instance, excitement of maximum approach behavior is induced by the interaction between pleasure and high arousal (Donovan & Rossiter, 1982; Mehrabian, 1980).

The M-R model indicates (see figure 2-4) that “preference was an increasing function of arousing quality in pleasant situations, an inverted-U shaped function of arousing quality in neutrally pleasant situations, and a U-shaped function of arousing quality in unpleasant situations” (Mehrabian, 1980, pg. 165). For instance, Donovan and Rossiter (1982) summarize that the higher the arousal level in a pleasant environment, the greater the approach behavior; moderate arousal levels enhance approach behaviors in a neutral environment; and the higher the arousal level in an unpleasant environment, the greater the avoidance behavior (figure 2-4). Therefore, it is important to note that under the condition of pleasure, arousal is a key mediator in predicting approach behaviors.

Speaking of intermediate arousal level, the results in the M-R model indicate that approach behavior is maximized in intermediate arousal level under the condition of a neutral environment. The M-R model describes that intermediate arousal level can be achieved by combination of task level and information rate. For instance, the M-R model indicates that moderate arousal level can be achieved
by lowering a task under the condition of a high information rate. On the other hand, high task with a low information rate can also induce intermediate arousal level as well.

In the study conducted by Donovan and Rossiter (Donovan & Rossiter, 1982), the evidence shows that the pleasure-arousal interaction has a positive effect in inducing approach behavior in the consumer's shopping-related intentions in a store environment. In other words, by increasing arousal level in a pleasant situation, approach behaviors, such as the following, can be enhanced: “(1) enjoyment of shopping in the store, (2) time spent browsing and exploring the store's offerings, (3) willingness to talk to sales personnel, (4) tendency to spend more money than originally planned, (5) likelihood of returning to the store (future patronage) (Donovan & Rossiter, 1982, pg. 56)”.

Figure 2-4. Pleasure-Arousal Interaction to Approach-Avoidance in the M-R Model
Berlyne’s Aesthetic Theory

Mehrabian emphasizes aesthetics in a shopping environment saying, “All types of clientele are more readily attracted by a pleasant store. This is why, aside from careful consideration of their visual aesthetics, some stores are designed to pleasantly stimulate the other senses as well” (Mehrabian, 1976). The notion of the importance of aesthetics is supported by Bell. He found that consumers’ preference of a shopping environment is strongly correlated with visual appeal of the space (Bell, 1999). Therefore, it might be necessary to compare arousal in the M-R theory with aesthetic theory, particularly Berlyne’s theory (1971), where “arousal” takes a central role as well.

Hedonic Value

Berlyne proposes that “hedonic value,” which is a concept similar to the concept of pleasure in the M-R model, is a characteristic of artistic judgment; he includes hedonic value with the other dimension called “uncertainty-arousal” (Bell et al., 2001; Berlyne, 1971).

However, the concept of hedonic value in Berlyne’s theory is somewhat different from the concept of pleasure in the M-R theory. The hedonic value refers to a combination of pleasure, reward value, feedback, attractiveness and intensive value. Therefore, positive hedonic value is determined by positive responses eliciting approach behavior, and can be considered equivalent to approach behavior. He found that confusion could occur between judgment of reward value and pleasantness. Determination of pleasantness, by using the “pleasant-unpleasant” scale, holds the possibility that the subject’s rate of pleasing can convey unfavorable responses (Berlyne, 1971).
Arousal

In the study of environmental psychology, or aesthetics, the dimension of arousal is strongly associated with external stimuli causing sensory experience (Berlyne, 1971; Mehrabian & Russell, 1974; Spies et al., 1997).

Complexity and novelty account for the central concept in determining arousal level in Berlyne’s aesthetic theory. In Berlyne’s aesthetic theory (Berlyne, 1971), complexity and novelty are considered as comparative variables similar to the concept of familiarity in the M-R model. In other words, one perceives environmental stimuli by comparing it with others. One has encountered; this concept is also associated with time differences. For instance, if different sets of environmental stimuli being perceived are juxtaposed, a lower information rate is elicited. It seems obvious that the level of novelty is strongly associated with this concept. Perception complexity also involves comparison, meaning that in order to define level of complexity, other stimuli should be compared too.

In Berlyne’s theory, arousal is hypothesized as a mediator of positive hedonic value. According to this hypothesis, the relationship between approach-avoidance behavior and arousal is explained by an inverted U-shape. This inverted U-shaped diagram (figure 2-5) shows that at a moderate level of arousal, the hedonic values are maximized. In other words, if the arousal level is extremely high, avoidance behaviors will be elicited and therefore, extremely high arousal levels should be avoided. Beauty should be judged by the intermediate arousal level (Bell et al., 2001; Berlyne, 1971).
Arousal control

Controlling the arousal level is the central concept in determining beauty. The intermediate arousal level is considered as the most beautiful, maximizes hedonic value, and has a similar concept of pleasantness (Bell et al., 2001; Berlyne, 1971). In this theory, pleasure is considered part of a positive behavioral result elicited by controlling arousal level.

Arousal-increasing devices and arousal-moderating devices are key concepts of controlling arousal level. A summary of these variables associated with perception is described in table 2-3. The idea is that interaction and manipulation of these two groups can explain different artistic expressions, considered as beauty. In other words, extremely different art works, such as Abstract-Expressionism, Action painting, or Minimal art, can be defined as intermediate arousal level by the combination of these two groups:
The Abstract-Expressionist, Tachiste, or Action painting of the 1950s induced arousal through extreme complexity, with abundance of minute details, lack of representational meaning or recognizable structure, use of techniques with unpredictable results such as allowing paint to drop or splashing paint from cans onto canvases, and suggestion of energetic bodily movement. The principle arousal-moderating devices were similarity of details, approximate parallelism of lines in at least parts of the painting, and concentration of shapes of a particular color in certain regions of the canvas, as well as the often noted fact that extreme complexity and randomness generate an impression of uniformity (as in the sands of the desert or the waves of the sea). All these features are absent from the Perceptual Abstraction, including Hard-Edge painting, Op art, and Minimal art, that has succeeded this style. Here arousal results mainly from highly saturated color, often coupled with the large size of uniformly colored areas, apparent movement, shifts in figure-ground relations, and unusual shapes of canvases. The extreme simplicity of composition, introducing a few areas of geometrical or near-geometrical shapes, has arousal-reducing potentialities, but these are partly compensated by the startling novelty of this degree of simplicity, which contrasts so markedly with all previous styles of painting (except for the style’s Constructivist and Neo-Plasticist forebears) (Berlyne, 1971, pg. 255).

Table 2-3. Arousal Control Devices (Berlyne’s Aesthetic Theory)

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<thead>
<tr>
<th>Arousal-Increasing Devices</th>
<th>Arousal-Moderating Devices</th>
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<tbody>
<tr>
<td>Novelty</td>
<td>Absolute novelty, relative novelty</td>
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<tr>
<td>Expectations</td>
<td>Surprise and incongruity, uncertainty, absence of clear expectations</td>
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<tr>
<td>Complexity</td>
<td>Number of elements, redundancy</td>
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<td>Conflict</td>
<td>Occurred when elements not fit well together</td>
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<td>Instability</td>
<td>Tension, imbalance</td>
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<tr>
<td>Ambiguity and multiple meaning</td>
<td>Complex meanings</td>
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Kaplan and Kaplan’s Preference Theory

In the study of environmental perception and preference, Kaplan and Kaplan’s preference theory is one of the dominant theories in environmental psychology. In this theory, cognition takes a central role in explaining environmental experience of individuals. In other words, perception is a picture (or best guess) as a result of integration, complicated processing, and interpretation of complex or meaningful stimuli (Bell et al., 2001). The Kaplan and Kaplan theory utilizes the cognitive map model in explaining environmental experiences of individuals.

The Cognitive Map

The cognitive map model has been proposed as a construct to explain how people know and experience the environment (Kaplan, 1973). This model assumes that people store perceived information in simplified form and in relation to other information based on pre-established experience, (Kaplan, 1973, 1982). Because individual experience is unstable and continuously changeable in a new event, the cognitive map is schematic, incomplete, and sketchy.

Kaplan and Kaplan define the cognitive map as “a compact, orderly collection of knowledge. It contains more information than one can generally perceive at once, thus permitting one to anticipate, to react, to consider possible next events. When one does not know what might happen next, the number of possibilities one can imagine can grow at an alarming rate. Thus having a more concrete conception of future possibilities tends to simplify one’s cognitive processing, and to contribute substantially to one’s confidence” (Kaplan & Kaplan, 1982, pg. 63).
The concept of familiarity, which is associated with past experience, is crucial in the cognitive map. People anticipate the possibility of next events and react to the environment by evaluating collected information. Familiarity allows people to conceptualize upcoming events and contributes to accuracy of the information.

Preference

Preference in the Kaplan and Kaplan theory is understood as an expression of basic human needs (Kaplan & Kaplan, 1982). In other words, this theory considers “knowing or intellectual desire” as a basic human faction for psychological health. Making sense and involvement are conceptualized as key elements of intellectual needs. Speaking of preference, people prefer environments and situations that fulfill these needs.

Making sense is described as the concept of familiarity. People prefer familiar environments to unknown environments. Kaplan and Kaplan state that “familiarity increases one’s confidence, one’s facility; it provides opportunities to use the cognitive maps that have already been developed... the motive to make sense inclines people to devote considerable effort to finding which of their cognitive maps applies to a given situation. It also ensures that people will be most uncomfortable in circumstances where no previously learned map is pertinent” (Kaplan & Kaplan, 1982, pg. 77).

In certain circumstances, however, people tend to be unfavorable toward familiar situations or to be favorable toward unknown stimuli, as table 2-4 explains. This phenomenon is described in the concept of involvement that is considered a basic human function. Kaplan and Kaplan state that “people also prefer circumstances that require them to expand their horizons or at least circumstances
where such enrichment is a possibility. People feel that, if they are to utilize their time and capacity fully, they must be exposed to circumstances that take all the capacity they have. Although people do not prefer to be overloaded or overwhelmed, they are usually at their best (and happiest) when the challenges they face fall just short of that. It must be, in other words, that it is inherent in people to seek and cherish involvement” (Kaplan & Kaplan, 1982, pg. 78).

Table 2-4. Familiarity x Preference Matrix (Kaplan & Kaplan, 1982, pg. 78)

<table>
<thead>
<tr>
<th></th>
<th>LOW PREFERENCE</th>
<th>HIGH PREFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW FAMILIARITY</td>
<td>That’s weird</td>
<td>I’ve never seen anything like that before! Wow! That’s neat!</td>
</tr>
<tr>
<td>HIGH FAMILIARITY</td>
<td>That old stuff again</td>
<td>No place like home</td>
</tr>
</tbody>
</table>

The preference framework

“The preference framework, up to this point, has been concerned with two basic informational needs – making sense and involvement- and with a time dimension that focuses on the immediate and the longer-term possibilities” (Kaplan & Kaplan, 1982, pg. 81).

In the Kaplan and Kaplan’s theory, preference is conceptualized as enhancing understanding and exploration (Kaplan, Kaplan, & Ryan, 1998), and it is determined by four informational factors: coherence, legibility, complexity, and mystery. The four factors are described in the following photographs and definitions:
1. **Coherence**, or the degree to which a scene “hangs together” or has organization – the more coherence, the greater the preference for the scene (Bell et al., 2001, pg. 43).

   ![Figure 2-6. Examples of Coherence (Kaplan & Kaplan, 1982, pg. 83)](image)

2. **Legibility**, or the degree of distinctiveness that enables the viewer to understand or categorize the contents of a scene – the greater legibility, the greater the preference (Bell et al., 2001, pg. 45).

   ![Figure 2-7. Scenes high in Legibility (Kaplan & Kaplan, 1982, pg. 87)](image)
3. **Complexity**, or the number and variety of elements in a scene – the greater the complexity (at least for natural scenes), the greater the preference (Bell et al., 2001, pg. 45).

![Figure 2-8. Scenes high in Complexity (Kaplan & Kaplan, 1982, pg. 84)](image)

4. **Mystery**, or the degree to which a scene contains hidden information so that one is drawn into the scene to try to find out this information (e.g., a roadway bending out of sight on the horizon) – the more mystery, the greater the preference. (Bell et al., 2001, pg. 45)

![Figure 2-9. Scenes high in Mystery (Kaplan & Kaplan, 1982, pg. 86)](image)
As indicated in table 2-5, Coherence and legibility are associated with making sense or understanding, while complexity and mystery are associated with motivation or exploration within an environment (Bell et al., 2001). “Coherence and complexity are based on the two-dimensional plane. They both involve the direct perception of the elements in the scene in terms of their number, grouping, and placement. Legibility and mystery, by contrast, require the inference of the third dimension. When viewing scenes, people not only infer a third dimension, but imagine themselves in the scene. These two factors involve the inference of what being in the pictured space would entail” (Kaplan et al., 1998, pg. 13). According to this theory, maximum preference can be achieved by those four combinations.

<table>
<thead>
<tr>
<th></th>
<th>MAKING SENSE</th>
<th>IN VolvEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRESENT OR IMMEDIATE (2-D)</td>
<td>Coherence</td>
<td>Complexity</td>
</tr>
<tr>
<td>FUTURE OR PROMISED (3-D)</td>
<td>Legibility</td>
<td>Mystery</td>
</tr>
</tbody>
</table>

Classification of Environmental Stimuli

Environmental settings, atmospherics, or physical design elements are recognized by storeowners, marketers, and researchers, as important factors in enhancing productivity. Most research on environmental elements conducted so far, relies on the concept of commodity. In other words, perceived value, quality of products, consumer satisfaction, and the decision-making process take central roles in the study of environmental stimuli based on cognition. The effect of store
surroundings is focused on this commodity concept. This is also a mainstream concept in the store design literature, though most is anecdotal.

Ever since Kotler’s hypothesis (1974) that atmospherics can effect purchasing behaviors or intentions (and it should be understood as a total marketing tool) environmentally elicited emotional perception affecting consumer behaviors became a new avenue among researchers in business fields. A number of studies confirm the important role of atmospherics affecting consumers’ emotional states and inducing certain behaviors. The M-R model also has a strong potential in this area and is also supported by the amount of evidence compiled in business fields.

In interior design, one of the important goals of store design is to create excitement in shopping experiences. However, it is surprising that no research or framework has been found in the study of the effects of design elements on emotion. There is some literature to be found, but this is mainly anecdotal or focused on commodity associated with store image or store quality. Surprisingly, the results of a study conducted by Baker and Parasuraman indicate that design factors such as architectural features, décor, or layout do “not influence either merchandise and service quality or service quality inferences” (Baker & Parasuraman, 1994, pg. 334). These findings are contradictory to Kotler’s hypothesis and other research presented in this thesis.

To understand the role of atmospherics or environmental stimuli, it is necessary to distinguish the concept of shopping intentions from the concept of patronage intentions; each has a different concept of mental responses. The relationship between shopping intention and a store environment is associated with cognition, while emotion induced by a store environment is related to patronage intentions:
Shopping intentions: subjective judgments of selection of stores based on demands of consumers (Blackwell, Miniard, & Engel, 2001). Store image with reflecting value and quality of products and service is associated with this intention.

Patronage intentions: subjective judgments of consumers about whether they have willingness to revisit a store again. This concept should be distinguished from repurchase intentions that refer to willingness to buy the same products or brand again (Blackwell et al., 2001). Patronage intentions might convey this concept as well. Positive emotional states (i.e., excitement) are associated with this concept, as well as satisfaction (Donovan & Rossiter, 1982).

Bitner’s Framework

The study of relationships between environmental stimuli and human reaction affecting consumer behavior were conducted by Bitner (1992). The framework (figure 2-10) in Bitner’s study suggests that environmental factors not only affect consumers, but also affect employees. Respondents in this framework perceive environmental stimuli holistically by establishing three environmental dimensions: 1. ambient conditions; 2. spatial layout and functionality; and 3. signs, symbols, and artifacts.

Ambient factors in this framework refer to background characteristics of the environment such as lighting, music, noise, odor, and temperature. These factors, sometimes, are generally unnoticeable when subjects are exposed in a long period in the environment. Bitner (1992) proposes the effect of ambient conditions in a store environment as following:

The effects of ambient conditions on the overall, holistic perception of the servicescape are especially noticeable when they are extreme (e.g., loud music, high temperature). When the customer or employee spend considerable time in the servicescape (e.g., hospital stay vs. visit to dry cleaner), and when they conflict with expectations (e.g., loud music in a law office) (Bitner, 1992, pg. 66).
Spatial layout in this framework is defined as "the ways in which machinery, equipment, and furnishings are arranged, the size and shape of those items, and the spatial relationship among them. Functionality refers to the ability of the same items to facilitate performance and accomplishment of goals" (Bitner, 1992, pg. 66). The major effect of these factors is hypothesized as to enhance task performance of consumers and employees.

The effects of spatial layout and functionality are particularly salient in self-service setting, when the tasks to be performed are complex, and when either the employee or customer is under time pressure (Bitner, 1992, pg. 66).

Signs, symbols, and artifacts refer to explicit or implicit signals of communication between consumers and an environment. Signs are defined as direct signals of communication such as labels of company name or department, directional signage, and labels of behavior rules (i.e., no smoking). Symbols and artifacts in this framework are defined as "implicit cues to users about the meaning of the place and norms and expectations for behavior in the place" (Bitner, 1992, pg. 66). Quality of materials, size of objects, space, and quality of lighting are all examples of communicating symbolic meanings. The effects of these factors are hypothesized as following:

Signs, symbols, and artifacts are particularly important in forming first impressions, for communicating new service concepts, for repositioning a service, and in highly competitive industries where customers are looking for cues to differentiate the organization (Bitner, 1992, pg. 67).
Figure 2-10. Bitner’s Framework for Relationship between Store Environment and Users (Bitner, 1986, pg. 60)
Bitner indicates that the three environmental dimensions, (ambient factors; layout and functionality; and signs, symbols, and artifact) elicit internal responses of both consumers and employees in three different ways: cognitive, emotional, and physiological responses. The cognitive response is associated with service qualities such as consumers' beliefs about the place, categorization of the service, and symbolic meaning of the place. Emotional responses are associated with the mood and attitude of consumers and employees toward the place. Bitner hypothesizes that these emotional responses are correlated to approach behaviors.

This framework also hypothesizes that the perceived servicescape affect people in purely physiological ways. These responses, according to this framework, are strongly associated with feeling of comfort elicited by the environment. According to the hypothesis, physiological responses "may influence seemingly unrelated beliefs and feelings about the place and the people there" (Bitner, 1992, pg. 64). The following is a summery of this hypothesis:

Positive (negative) physiological responses to the servicescape can result in positive (negative) beliefs and feelings associated with the organization, its people, and its products (Bitner, 1992, pg. 64).

**Environmental Dimension vs. Emotion and Cognition**

Customers' responses are induced by the store environment; in general, atmospherics can be considered from two different standpoints: emotional inducement and cognitive inducement. Emotional responses are strongly associated with feelings of excitement, desire to explore, desire to stay, and affiliation. Cognitive responses are strongly associated with store images.
In marketing or business research, several studies have dealt with relationship and emotional states, particularly regarding pleasure and arousal. Baker et. al. (1992) categorized environmental stimuli in three areas: ambient, social, and design factors. They tried to establish relationships among these three areas and the emotionally elicited consumer behaviors that Donovan and Rossiter hypothesized. Table 2-6 summarizes the relationship between environmental dimensions and consumers’ perception.

**Ambient factors**

Ambient factors in business literature are considered as those unconsciously perceived environmental factors such as temperature, scent, noise, music and lighting (Baker et al., 1992; Baker & Parasuraman, 1994; Wakefield & Baker, 1998). These factors are positively related to pleasure (Baker et al., 1992). If acceptable ranges of these factors are exceeded, consumers are aroused and become displeased. Baker found that customers are aroused by lighting and temperature when these factors exist at unpleasant levels (Baker & Cameron, 1996).

The concept of ambience in store environments is also related to cognition known as ambience cues. Ambience cues elicited by environmental stimuli are strongly related to consumers’ inferences with regard to merchandise or service quality (Baker & Parasuraman, 1994; Sharma & Stafford, 2000). The concept of ambience cues, which should be distinguished from ambient factors, is the perceived image or mood elicited by environmental stimuli in a holistic way. In other words, a perceived store image regarding merchandise or service quality is understood as a whole. Sharma and Stafford (2000) suggest that under the condition of matched ambience between atmospherics and
store images, between prestige ambience or discount ambience, positive persuasion can be enhanced. This concept is also introduced by Bitner (1992) suggesting that ambience is the overall perception of store environments and becomes noticeable when the perceived ambience comes in contact with a subject's lack of expectations. For instance, consumers are alerted under conditions of unmatched sensory stimuli (i.e. strong beat music in a law office).

**Social factors**

Social factors affect both store employees and customers within a store environment. The number, types and behaviors involving social factors can influence consumers' perception of store images (Baker et al., 1992; Baker & Parasuraman, 1994). The social factors are interrelated with ambient factors in determining the quality of merchandising and service as well. According to business literature on the subject of ambience factors, there is a strong association between cognitive perception and perceived image of merchandising or service quality. However, the relationship between these concepts and emotion is rather weak; therefore, it should be considered with appropriate skepticism when determining emotional responses.

**Design factors**

According to Baker and Parasuraman, design factors are more related to visual elements (Baker & Parasuraman, 1994). They defined elements of these factors considering them as functional elements and aesthetic elements. "Functional store elements include layout, comfort, and privacy. Aesthetic elements include factors such as architecture, color, materials, and styles (Baker & Parasuraman, 1994, pg. 330)."
Design factors are hypothesized as strong indicators of eliciting approach behaviors, such as excitement, exploration, and desire to stay, all induced by emotional states; this hypothesis is supported by Wakefield and Baker (1998). Also, they found that architectural design has the strongest positive influence on excitement; music, known as one of the ambient factors, and layout both have positive influences on the approach behaviors.

These results provide a strong case for determination of emotional response induced by environmental stimuli. First, design factors defined by marketers are strongly associated with the emotional dimension of pleasure. For instance, if excitement is strongly associated with the overall perception of design factors as Wakefield and Baker (1998) state, and if ambient factors have a positive influence on pleasure, as Bitner (1992) states, then the overall impact of design factors can be considered as environmental stimuli affecting perceived pleasure. Second, if the environmental elements affecting pleasure are classified using design factors, the results might be associated with perceived arousal level. Thus, according to the M-R model, the excitement is the result of interaction between pleasure and arousal.

At this point, it may be necessary to differentiate between the concept of layout in business literature and the concept of layout in store design literature. In the business literature, the term layout is utilized as a component of environmental stimuli, whereas, in the store design or interior design literature, the concept of layout is much broader and a guideline for designing entire spaces. Layout in business is understood in terms of task performance and movement. For instance, Bitner (1992) states that clear layout can enhance shopping tasks, particular forms of positive interactions between employees and consumers, and perceived personal control. Changing allocation of products or service
facility influences speed or flow of transactions, thereby influencing shopping time in a store.

In interior design, layout is conceptualized as more than just store planning in retail design. In other words, it reflects every aspect of human activities or behaviors. It reflects emotional, cognitive, ecological, and functional aspects as well as merchandise and service qualities (Ketchum, 1957). However, although the literature in store design emphasizes aesthetics or emotion and considers such attributes as attractiveness and excitement, overall contexts emphasize the utilitarian shopping experience. Therefore, more research needs to be initiated in this wide-open field exploring the emotional experience, which shoppers encounter in every store environment.
Table 2-6. Environmental Dimensions and Effects from Business Literature

<table>
<thead>
<tr>
<th>ENVIRONMENTAL DIMENSION</th>
<th>EMOTION</th>
<th>COGNITION</th>
<th>INDUCED BEHAVIORS</th>
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</thead>
<tbody>
<tr>
<td><strong>Ambient factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature*</td>
<td>Pleasure**</td>
<td>Store image (prestige, ambience, discount ambience) +</td>
<td>Excitement and desire to stay.</td>
</tr>
<tr>
<td>Scent*</td>
<td>Comfort+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise*</td>
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<td>Music*</td>
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<tr>
<td>Lighting*</td>
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<tr>
<td><strong>Social factors</strong></td>
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<tr>
<td>The number, type, and</td>
<td>Pleasure, arousal**</td>
<td>Merchandise quality and service quality (prestige social</td>
<td>Excitement (design) and desire to stay+++</td>
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<td>behavior of other</td>
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<td>environment) +</td>
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<td>customers and sales</td>
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<tr>
<td>personnel ***</td>
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<td></td>
<td></td>
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<tr>
<td><strong>Design factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layout*</td>
<td>Personal control = pleasure #</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architectural elements*</td>
<td>Arousal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design and décor *</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

* (Baker et al., 1992; Wakefield & Baker, 1998)
** (Baker et al., 1992)
*** (Baker et al., 1992; Baker & Parasuraman, 1994)
+ (Sharma & Stafford, 2000)
++ (Baker & Parasuraman, 1994)
+++ (Wakefield & Baker, 1998)
# (Bitner, 1992; Spies et al., 1997)
CHAPTER 3. SCHOLARLY METHOD

The Scholarship of Integration

The notion that making connections across other disciplines is one of the most important scholastic activities in academia is shared among educators and scholars (Boyer, 1990). In the national survey of faculty in 1989, 75 percent of faculty in higher education agrees that multidisciplinary work should be considered scholarship. A scholarship of integration is defined as "serious, disciplined work that seeks to interpret, draw together, and bring new insight to bear on original research" (Boyer, 1990, pg. 19). In store design research, this scholarship is very important because the design discipline can integrate and synthesize other disciplines such as art, business, and science in design contexts.

Qualitative Study

This study is conducted based on a qualitative study approach. According to Creswell (1994), the qualitative study is "an inquiry process of understanding a social or human problem, based on building a complex, holistic picture" (Creswell, 1994, pg. 1). In empirical worlds, most studies dealing with environmental behaviors are based on behavioral measurements between single or multiple independent variables, and the results are known as dependant variables.
These kinds of quantitative studies can well describe human behaviors in a specific condition, but they might be unable to interpret the results as global results in everyday situations. In the study of emotion, quantitative approaches might make it difficult to understand the phenomenon of emotional response as a whole, or as a holistic approach. However, qualitative approaches do not ignore quantitative approaches; the results of studies of quantitative approaches can be understood within qualitative approaches. Qualitative studies do not limit research methods. The qualitative researchers are interested in understanding social or human phenomena as a broader, holistic picture.

The research method of this thesis is also supported by the notion that “one of the chief reasons for conducting a qualitative study is that the study is exploratory; not much has been written about the topic or population being studied, and the researcher seeks to listen to informants and to build a picture based on their ideas” (Creswell, 1994, pg. 21).

First, in the store design field, no study has been found determining the framework that systematically explains the interrelationship between environmental stimuli and customers’ emotional responses.

Second, because emotional experience, especially attractiveness or excitement, is one of the key goals in store planning and design, understanding of the framework as a whole picture is necessary. Although several studies have been conducted in environmental psychology and marketing fields, such as the M-R model, Berlyne’s aesthetic theory, Kaplan and Kaplan’s preference theory, and other empirical marketing studies, the holistic understanding of the interrelationships between store environments and emotional reaction is rather weak and sketchy; therefore, more research is necessary.
The central approach of this thesis is constructionism based on grounded theory. Constructionism is also called constructivism or perspectivism (Schwandt, 2000). The constructive approach is one of the main philosophies used in qualitative studies. The view of this approach is that "all knowledge claims and their evaluation take place within a conceptual framework through which the world is described and explained" (Schwandt, 2000, pg 197). Also, "constructivism assumes the relativism of multiple social realities, recognizes the mutual creation of knowledge by the viewer and the viewed, and aims toward interpretive understanding of subjects' meanings" (Charmaz, 2000, pg. 510).

The proposed theoretical framework is derived from interpretation of multiple theories and empirical studies; this approach is known to be one of the most grounded theory methods in qualitative studies (Charmaz, 2000). This approach is also supported by Charmaz who claims that "grounded theory methods consist of systematic inductive guidelines for collecting and analyzing data to build middle-range theoretical frameworks that explain the collected data. Throughout the research process, grounded theorists develop analytic interpretations of their data to focus on further data collection, which they use in turn to inform and refine their developing theoretical analyses" (Charmaz, 2000, pg. 510). The grounded theory methods are also utilized to understand empirical worlds, and are emphasized as flexible, heuristic strategies (Charmaz, 2000).

In this thesis, the author tries to understand existing theories, from a designer's standpoint, and to make sense of the relationship between environmental stimuli and emotional responses in store environments. This thesis is an attempt to develop an exploratory framework and to form a bridge between design worlds and other disciplines, such as environmental psychology and business, by
integrating and synthesizing other disciplinary studies.

**Delimitation**

This thesis is based on the M-R model claiming that three independent emotional dimensions - pleasure, arousal, and dominance - can explain most emotional responses induced by environmental stimuli; these three dimensions can predict the nature of human behaviors elicited as emotional reactions. This model is also broadly utilized among business researchers who conduct studies of environment-consumer behavior relationships; yet Mehrabian (1976) failed to define the relationship between emotion and the store environment.

The scope of this study focuses on relationships between physical store environments and emotional response. Due to lack of research in interior or retail design fields and lack of understanding of interior or store design among marketing researchers, the author's interpretation will be applied based on a qualitative approach, grounded in theory described in this chapter.

This thesis should be understood as the first attempt at an exploratory study of store environment-emotional shopping experience in the interior design field. Therefore, it might be necessary and advantageous to conduct subsequent qualitative studies or quantitative studies for support or for further development.
CHAPTER 4. ANALYSIS AND SYNTHESIS

In this chapter, the author tries to integrate and synthesize theories from other disciplines based on reviewed literature. Critical analysis is utilized to derive common concepts from the theories to determine emotional experience in a store environment and to discover an exploratory framework to understand the phenomenon of emotional experience in a holistic way. As mentioned in chapter 3, the critical analysis is based on the interpretation from a designer's standpoint based on grounded theories.

This chapter is organized as follows: first, definitions of terms are established; second, integration of the M-R model, Berlyne's aesthetic theory, and Kaplan and Kaplan's preference theory is attempted; third, interaction of emotional dimensions are reestablished; finally, typology of environmental dimensions is discussed.

Definition of Terms

In determining a framework, it is important to define the terms clearly, otherwise the concepts of each term utilized in various theories might refer to totally different ideas or concepts in another; hence, readers could be confused by similar terms utilized in other literatures. The most common and confusing key terms utilized in the study of environmental psychology and preference are: emotion, cognition, pleasure and arousal. Therefore, clear definitions of these terms are attempted and presented here.
Emotion

The term emotion should be understood as a generic term. In other words, the concept of emotion in this framework is neither independent or a precondition of cognition, as Zajonc (1984a) describes, nor the result of cognition as Leventhal describes (1984). Simply, emotion can be described as subjective feeling.

The feelings associated with unconsciousness might be related to physical sensations such as hot and cold. In the M-R model, emotion seems to be separated from cognition as indicated in chapter 2. Mehrabian (1980) considers emotion as a precondition of cognition and a separate entity. This notion also can be seen in the concept of arousal in the M-R model. For instance, this model emphasizes that immediacy in information rate is correlated to arousal level, even though the concept of familiarity is introduced in the M-R model.

The generic term “subjective feeling” is also associated with individual experience, which is a result of a cognitive or conscious thinking process. The cognitive thinking process, described as the “cognitive map theory” in Kaplan and Kaplan’s preference theory, is a major factor in the perception and preference theory. It seems fairly obvious that store design relies on cognitive thinking processes. The Disney Store, Rainforest Café, Nike Town on 5th Ave. in New York, or any number of casinos in Las Vegas are examples of the use of a cognitive approach affecting emotional experience. Therefore, the cognitive thinking process should not be excluded from emotion, but it should be distinguished from the concept of cognition associated with the decision-making process in a store environment.
In short, the term “emotion” should be understood as perceived feeling induced by atmospherics; it includes cognitively induced feeling, termed cognitive-emotion. This feeling is not associated with cognitive appraisal such as price, product availability, service quality, or product quality. Emotional responses include liking, disliking, happiness, love, excitement, hatred, fun, boredom, relaxation, comfort, etc. (It should be noted that emotion is known to relate to patronage intention.)

Cognition

In marketing, cognition is directly related to shopping intentions. Cognition refers to subjective judgments of selections in stores, based on demands of consumers. The concept of the shopping intention has two values, known as hedonic value and utilitarian value. Utilitarian value is strongly associated with the subjective judgments of consumers, based on intellectual appraisal of price and value of products. These activities are obviously conscious.

Hedonic value is not necessarily the result of any conscious thinking process associated with conscious appraisal. Consumers do go shopping simply for fun or for fulfilling intellectual desires. The M-R model describes this as the concept of arousal seeking tendency; Kaplan and Kaplan explain this concept as intellectual needs, which are described as basic human functional needs in the cognitive map. For eliciting excitement and fun, this concept of Hedonic value should be considered related to emotional experience in a store environment.

Cognition, therefore, should be understood as conscious thought regarding to consumers’ perceived value-oriented appraisal in a store environment. This concept is a major consideration in consumer science and store planning as well. For example, allocation of products (such as demand
and impulse goods), consumer satisfaction, usage of coupons or signage, and creation of store image are all based on this concept of cognition.

**Pleasure**

In the M-R model, the emotional dimensions of pleasure, arousal, dominance (PAD), are considered as separate entities and independent dimensions. Verbal expressions of pleasant states that a person experiences are: happy, pleased, satisfied, contented, hopeful, and relaxed (Mehrabian, 1976, 1980; Mehrabian & Russell, 1974). The M-R model suggests that preference or approach-avoidance behaviors are results of emotional states plus the interactions among these dimensions, especially the interaction between pleasure and arousal.

The M-R model proposes that under the condition of a pleasant situation, the greater the arousal the greater the preference. In a neutral situation, induced approach behavior is the function of the inverted U-shaped relationship between pleasure and arousal. In other words, preference is maximized at intermediate levels of arousal in a neutral setting. Finally, under the condition of an unpleasant situation, the greater the arousal level the greater the avoidance behaviors.

Berlyne's comment that positive results of “pleasant” can be met by unfavorable responses has an important and significant meaning for this study. If positive results of the subject’s rate of pleasing connote possibly unfavorable responses, approach-avoidance behavior can be biased. Therefore, a definition of pleasure should be reestablished. Second, within the retail setting, Donovan and Rossiter found that pleasure is a strong predictor of all measures of approach-avoidance behaviors in retail environments and is positively associated with willingness to spend more time and money (Baker et
al., 1992; Donovan & Rossiter, 1982; Donovan et al., 1994). However, the measurements of consumers’ emotional states might not be reliable for the study of effects of store environments, because predictability of behavioral response is critical in retail environments.

The M-R model does not provide any correlation between environmental stimuli and induced pleasure. In other words, it is unclear which environmental stimuli elicit the emotional states of pleasure, displeasure, or neutral feelings. Therefore, it may be necessary to redefine the concept of pleasure induced by environmental stimuli.

The condition of pleasure should meet the following requirements in formulating interactions in the pleasure-arousal relationship. First, pleasure is independent from arousal. Secondly, pleasure should be elicited by environmental stimuli. Finally, environmental stimuli affecting pleasure should not be related to the environmental stimuli affecting the arousal level.

In the verbal assessment of pleasure, comfort is independent from the assessment of arousal and dominance in the M-R theory. It is important to note that Bitner (1992) indicates that physiological responses are some of the independent internal reactions of consumers. Comfort is a major reaction of the physiological responses. Therefore, Pleasure might be understood as physiologically or mentally comfortable feelings induced by atmospherics. Quality of pleasure is bipolar and its stimuli are usually unnoticeable. In other words, no neutral situation exists and only pleasant or unpleasant feelings are experienced. If the level of stimuli is exceeded during a short period of time, change is adaptable, but soon, unpleasant feelings are elicited.
Arousal

The definition of arousal in the previous literature introduced in chapter two may need clarification to distinguish pleasure from arousal induced by environmental stimuli. For example, in the M-R model, arousal is defined as "a feeling state varying along a single dimension ranging from sleep to frantic excitement" (Mehrabian & Russell, 1974, pg. 18), or as "a combination of activity and alertness" (Mehrabian, 1980, pg. 16).

First, the term "excitement" conveys a pleasant feeling state. Second, it is inappropriate to measure arousal levels by using the component of activities in a store environment, because the number of activities might be low. In Berlyne's aesthetic theory, hedonic value is considered the result of an intermediate arousal level. In other words, the concept of arousal in these two theories conveys a feeling state of pleasure. Arousal should be an independent factor in determining approach behaviors. The atmospherics-arousal relationship and the atmospherics-pleasure relationship should be independent from each other.

Arousal therefore, should be understood as the feeling state that subjects' experience and the degree to which these subjects are aware of environmental stimuli. The awareness of stimuli is strongly associated with sense modalities such as sight, smell, taste, touch, and sound. The concept of perceived arousal should be understood as pure-arousal, which is a result of pure sense modality exposure, and cognitive-arousal, associated with a subject's pre-established cultural or personal experiences. Arousal is a separate and independent entity from its pleasure.
Integration of the Three Theories

To synthesize or integrate existing theories (the M-R model, Berlyne's aesthetic theory, and Kaplan and Kaplan preference theory) reviewed in chapter two, critical analyses of the reviewed theories are attempted, and then integration of the theories is attempted. Since, the M-R model has been broadly utilized and tested, the analysis and integration is focused on the M-R model here.

The Critical Analysis of the M-R Model

The significance of the M-R model in store design is that it presents independent dimensions for affecting emotional response, eliciting various types of human behavior; moreover, each emotional dimension is induced by environmental stimuli. In other words, specific environmental stimuli affecting specific emotional dimensions, as well as human behaviors enhanced by emotions, can be predictable. This model brings new insight in the fields of marketing and interior design.

First, emotional responses, or emotion involved in shopping experiences, are important factors in designing stores to enhance productivity. Secondly, the concept of emotional responses supports the importance of atmospherics associated with environmental characteristics, other than products, and should be considered as a marketing strategy. Thirdly, the M-R model shows how consumer behavior elicited by emotional states can be predictable; thus store planners or designers can control environmental stimuli to enhance positive store experiences and productivity. Finally, this model can generate a new avenue of research for interior design scholars who study the design of retail environments.
There are, however, several limitations in this model. First, the M-R model explains emotion as a separate entity from cognition, as Mehrabian defines emotion as "the precognitive or rudimentary aspects of cognitive response to situations" (Mehrabian, 1980, pg. xviii). However, one of the emotional dimensions, arousal, is associated with cognition, though Mehrabian emphasizes the importance of immediacy in arousal. According to the M-R model, the information rate is strongly correlated with inducing the arousal level, and the information rate involves the cognitive thinking process. The distinction between emotion and cognition seems rather unclear in this model.

In the study of consumer behaviors, cognition is associated with product value, the major concept of commodity, and has a central role in the consumer's decision-making process. Therefore, it would be helpful to have a clear definition of emotion and cognition established.

Secondly, according to the M-R model, the three emotional dimensions are independent from each other, so interaction among emotional dimensions can explain emotional states enhancing approach-avoidance behaviors. However, the concept of pleasure is somewhat questionable. In other words, if the emotional dimension "pleasure" is elicited by environmental stimuli, this model should clarify the interrelationship between the stimuli and pleasure level. Also, the concept of pleasure, displeasure, and neutral is unclear. Berlyne (1971) points out that arousal and pleasantness are related. For example, to fulfill the requirement of independence in pleasure, three different levels should be elicited excluding arousal caused by sound, vision, temperature, and touch. In other words, in order to achieve the pleasure level, a minimum of arousing factors are necessary. Therefore, the definition of pleasure could be reconsidered.
Finally, there is the lack of a classification of environmental stimuli for inducing emotional responses (Baker et al., 1992). Thus, it is necessary to survey characteristics or classification of environmental stimuli affecting emotional reaction to the environment.

Commonality among the Theories

In regard to approach behaviors and preference, it might be interesting to compare the M-R model with other theories of preference, such as Berlyne’s aesthetic theory and the Kaplan and Kaplan preference theory as indicated in table 4-1. There are common concepts shared among these theories.

First, “pleasure” and “arousal” take central roles in determining approach behaviors. As mentioned earlier, in the M-R theory an approach behavior is maximized when high arousal is induced in a pleasant situation. In other words, the higher the arousal levels in a pleasant environment, the greater the preference. In Berlyne’s theory, preference is redefined as the concept of a hedonic value conveying the concept of pleasure, as the M-R model indicates. Arousal in the aesthetic theory is the most important factor in determining the hedonic value.

In Kaplan and Kaplan’s theory, pleasure and arousal can be central concepts in determining preference, although the theory does not emphasize the terms, “pleasure and arousal.” First, the term preference conveys the concept of pleasure, since the M-R model states that the term “prefer” is correlated with the word “pleasing,” and “pleasing” is an important determinant of pleasure in the model. Second, “complexity” and “familiarity” are central concepts of determining preference in the Kaplan and Kaplan’s theory, since “complexity” and “novelty” are the key determinants of arousal
Complexity and novelty are central concepts in determining the load of any environment in the M-R model. These two concepts are key determinants of arousal level. Complexity is the perceived quality of the number of elements, variety of elements, or changes. Novelty can be described as the perceived quality of the surprising, the unfamiliar, the unexpected, and the new (Donovan & Rossiter, 1982).

Donovan and Rossiter (1982), however, conclude that the information rate is not directly correlated to the arousal level. They found that three information rate measures (novelty, density, and size) increase arousal, whereas variety, focusing on store layout or design features, decrease arousal. Therefore, it seems that the information rate is a partial determinant of arousal.

It may be interesting to note the result of a study on variety conducted by Wakefield and Baker (1998). In their study in a mall environment, they found that tenant variety is the strongest factor affecting perceived excitement. In other words, because excitement is induced by interaction between high arousal and pleasure, variety can be considered as a factor of information rate. Therefore, there is a possibility that store layout or design features might not be good determinants for measuring the level of variety.

This concept of comparison between the perception and the degree of environmental stimuli in complexity and novelty can be very significant in store design environments. First, under the pressure of competition with other stores, this concept can enable a store designer to create a unique store environment so that consumers can enjoy a unique shopping experience. Second, under different environmental configurations, the composition of environmental stimuli should be varied enough to...
get the intended level of arousal, enhancing excitement during the shopping experience.

The concept of arousal in determining preference in the Kaplan theory is similar to Berlyne's aesthetic theory (see table 4-1). Complexity and mystery are associated with arousal-increasing devices, such as complexity and novelty. Coherence and legibility are associated with arousal-moderating devices, such as familiarity, predictability, grouping, and patterning.

Table 4-1. Three Different Theories on Preference

<table>
<thead>
<tr>
<th>M-R model</th>
<th>Berlyne's aesthetic theory</th>
<th>Kaplan and Kaplan theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPROACH</td>
<td>HEDONIC VALUE</td>
<td>PREFERENCE</td>
</tr>
<tr>
<td>Pleasure</td>
<td>Arousal</td>
<td>Coherence</td>
</tr>
<tr>
<td>+</td>
<td>(Arousal-increasing devices)</td>
<td>+</td>
</tr>
<tr>
<td>Arousal (Information rate)</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Arousal-moderating devices)</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Complexity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mystery</td>
</tr>
</tbody>
</table>

Interaction of Emotional Dimensions

In the M-R model, pleasure-arousal interaction is directly correlated with approach-avoidance behaviors: an approach behavior is maximized when arousal level is higher in a pleasant situation. In a neutral situation, moderate arousal levels can maximize the preference. According to Mehrabian and Russell, moderate arousal levels can be achieved by a combination of low task and high information
rate, or by a combination of high task and low information rate.

Donovan and Rossiter (1982) support the M-R model in their empirical study, finding that in a pleasant situation in a store environment, preference or excitement of consumers was maximized when arousal levels were higher; however, limitations can be found.

First, distinction between emotion and cognition is unclear in the measurement of emotional states. For instance, "satisfied-unsatisfied," a verbal assessment of pleasure level, and "excited-calm," a verbal assessment of arousal level, might be strongly associated with cognition of commodity. Second, as mentioned earlier, the arousal scale (excited-calm) is strongly associated with pleasure.

Thirdly, the concept of pleasure induced by atmospherics is not clearly differentiated from the concept of arousal. The measurement of pleasure is established by subjects' evaluations in a verbally described environmental situation. It might be questionable as to whether the response would be the same under physically uncomfortable situations: survey in a very cold environment, in a hot temperature, during a hunger period, etc.

Finally, from a designer's stand point, assuming that the pleasant-arousal relationship in the M-R model is accurate, it does not make sense that maximum excitement in shopping should be achieved when an arousal level involving complexity, density, or novelty is extremely high in a pleasant environment. Additionally, most stores are considered as message creating environments for their consumers. Therefore, it might be appropriate to give credit to Berlyne's arousal concept.

Arousal should be understood by using the inverted U-shape function of approach. In other words, an intermediate arousal level maximizes an approach behavior or preference. The maximum level of preference is achieved by a combination of intermediate levels of complexity, novelty, or
surprise (Bell et al., 2001). From this notion, it is believed that the arousal level is controlled by interaction between arousal-increasing devices and arousal-moderating devices (Berlyne, 1971).

The preference theory by Kaplan and Kaplan can be explained using this concept of intermediate arousal level (see table 4-1). According to the theory, preference is maximized when four informational factors (complexity, mystery, coherence, and legibility) are maximized. As mentioned earlier, the concept of complexity and mystery is correlated with the concept of arousal increase devices, and the concept of coherence and legibility is correlated with the concept of arousal moderating devices in Berlyne’s theory.

**Typology of Environmental Dimensions**

Categorization of environmental stimuli in determining human behavior in a store environment might be one of the least researched areas. It is also the common limitation of the M-R theory, Kaplan and Kaplan’s preference theory, and Berlyne’s aesthetic theory.

In business literature, attempts to categorize environmental stimuli affecting emotional states of consumers have been established. Bitner (1986) proposes three categories of environmental stimuli (ambient condition, layout and function, and sign, symbols and artifacts) as the environmental dimensions in determining environmental experience in a store environment. However, using the holistic approach to understand environmental stimuli, systematic relationships between the three environmental dimensions and internal responses are lacking.
Baker et al. (1992), also propose three environmental dimensions (ambient factors, social factors, and design factors) in determining emotional responses. The M-R model takes a central role in this study, finding that the ambient factors are correlated with pleasure, and the social factors are correlated with arousal, and partially with pleasure. The study by Baker et al. is significant because it emphasizes relationships between environmental stimuli and emotional states. From the designer’s viewpoint, however, again, some limitations can be found.

First, from a designer’s standpoint, some studies show a lack of understanding design terms. Baker et al. (1992), and Wakefield and Baker (1998) defined “layout” as a one of the design factors, hypothesized as correlated with arousal level. In interior design, as mentioned earlier, “layout” is conceptualized as a broader concept in space planning. It reflects not only every aspect of human function and behavior, it also reflects aesthetics. It is a master plan for organizing and designing the space. Therefore, layout should be excluded from the environmental stimuli affecting the emotional state of arousal, because it contains other aspects affecting pleasure level.

The term ambient factor is also an example of misunderstanding of store design. Ambient factors are hypothesized as factors correlated with pleasure level, and are defined as unnoticed factors in an environment (Baker et al., 1992). Scent, music, and lighting can be utilized as attention creating devices in designing a space. Lighting is particularly emphasized as an important factor to highlight display areas and products. Scent can be an important indicator to attract consumers to food courts or food departments in a grocery store with smells, such as bread or coffee. Music might capture by-passers’ attention as well. Therefore, certain characteristics of ambient factors utilized for creating attention should be considered as factors affecting the emotional state, called arousal.
It is significant that ambient factors are associated with pleasure in determining environmental stimuli affecting emotional responses. These factors are strongly associated with feelings of comfort. At this time, it should be noted that comfort level is strongly associated with physiological responses, which are hypothesized as independent internal responses elicited by environmental stimuli, according to Bitner’s framework. Therefore, it can be derived that ambient factors and physiological factors are those inducing the emotional state, called pleasure.

The social factors are defined as the number, type, and behavior of other customers and sales personnel. Also these factors are cues in determining quality of merchandising and service as well. In this case, the consumer might utilize these factors as visual resources and informational cues. Baker et al., found that these factors are correlated with arousal in a high-image store. Therefore, people themselves can be considered as factors of visual resources affecting arousal.
CHAPTER 5. THE FRAMEWORK

This model, the adaptive theoretical framework, has been developed based on the M-R model, which was tested and is considered a promising model among business researchers. The central idea of this model is that approach behavior, such as liking, positive motivation of exploration, desire to stay, affiliation, and time spending, induced by store atmospherics is more related to perceived emotional dimensions like pleasure and arousal than to cognitive responses. Moreover, pleasure and arousal have an interrelationship in determining approach behavior, though pleasure and arousal are independent. Finally, specific environmental dimensions influence each emotional dimension.

The proposed adaptive theoretical framework explains effects of environmental stimuli on emotional responses affecting approach behavior. Although the nature of the store environment is strongly associated with cognitive thinking processes, the value and risk relationship is dominant in business fields. This model attempts to separate emotional components from cognitive elements.

The organization of this framework is divided into three parts. The first part explains the interaction between two emotional dimensions, pleasure and arousal, in a store environment. In the second part, the typology of atmospherics affecting the two emotional dimensions will be discussed.

Finally, the issue of controlling atmospheric dimensions will be addressed. In store planning, control or composition of environmental stimuli is the primary concern. However, no study has been found with a correlation between environmental stimuli and emotion. Although several studies conducted by business researchers have been found, the systematic relationship is rather unclear; this might be due to the lack of understanding of store planning among the business researchers. Thus, the
adaptive theoretical framework proposed here suggests that a clear relationship exists between store environmental stimuli and emotion.

**Definition of Terms**

Before the proposed framework is discussed, it is necessary to define the scope of the framework being utilized in this model. As mentioned previously, the proposed framework focuses on store environments affecting consumers' feeling. Therefore, the scope of the store environment that can be applied by this model should be explained. Also, it is important to define the terms emotion, cognition, pleasure, and arousal. These are not only key terms used in this model, but also could be confused with similar terms utilized in other literatures.

**Atmospherics:** The controllable environmental characteristics convey physical and nonphysical elements within a store, affecting approach-avoidance behaviors of both consumers and employees.

**Emotion:** The perceived feeling induced by atmospherics including temporal feelings or cognitively induced feelings, termed cognitive-emotion. Emotional responses include liking, disliking, happiness, love, excitement, hate, fun, boredom, relaxation, comfort, etc.

**Cognition:** The conscious thought referring to consumers' perceived value-oriented appraisal in a store environment.

**Pleasure:** The physiologically or mentally comfortable feelings induced by atmospherics. Quality of pleasure is bipolar and its stimuli are unnoticeable unless they are exceeded certain level.

**Arousal:** The feeling states that subjects' experience and the degree to which these subjects are aware of environmental stimuli that are related with sensory experience.
Pleasure-Arousal Interaction

The central concept of a pleasure-arousal interaction is that these two emotional dimensions are separate entities, and perceived emotion induced by atmospherics is a result of interactions between pleasure and arousal. Also, environmentally induced emotion should be understood as a holistic environmental experience. Happiness, excitement, preference, or liking are the result of pleasure-arousal interaction. As mentioned earlier, pleasure refers to physiological and anthropometrical comfort in a store environment, and arousal is defined as subject's feeling of alertness or awareness of environmental existence.

Pleasure is conceptualized in the proposed framework as a precondition of enhancing approach behavior. Pleasure is directly correlated with the level of physiological and anthropometrical comfort. It requires a certain level of environmental stimuli. For instance, temperature or lighting should meet certain levels of acceptability. If the level is exceeded or lacking, unpleasant responses will be elicited. Cognitive-emotion is excluded from pleasure in this framework because it is associated with perceived arousal. In other words, contentment, happiness, satisfaction (excluding physiological factors), and hope are excluded from components of pleasure in this framework.

Approach behavior in this framework is shown by the inverted U-shaped function of arousal under the condition of pleasant atmospherics (figure 5-1). In other words, maximized preference, or approach behavior, can be achieved by a moderate level of arousal in a pleasant situation. Therefore, extreme arousal levels should be avoided.
A characteristic of arousal is strongly associated with already established individual experiences and perceived comparisons. For instance, the perception of novelty might be caused by lack of familiarity and experience. Unexpected encounters are also associated with individual experience. Complexity and strong contrast of colors and materials might elevate arousal level, but the perceived arousal might be different by individual, culture, and surrounding environments, because perceived arousal level is comparative. For instance, in surroundings where environments are dense or crowded and complex, simpler environmental characteristics with novelty might achieve higher arousal levels more easily rather than through more complex environmental configurations.

Significant to the concept of pleasure-arousal interaction is that it can explain designers' creative works in store planning. In other words, even though, the composition of atmospherics is varied as a result of store planning, the induced emotion can be same. For example, the arousal level in a very simply designed store and in a complex store can be the same in both situations. This notion is also shared by Berlyne's aesthetic theory. Controlling environmental stimuli to achieve a moderate level is therefore important in this framework under the condition of pleasant environment. Unique experience, happiness, excitement, or attractiveness can be explained and achieved by applying this theoretical framework.
Atmospheric Dimensions and Pleasure-Arousal

In this framework, emotional states can be considered as feeling states directly induced by atmospheric dimensions. Typology of atmospherics (figure 5-2) is based on the idea that specific environmental characteristics influence each emotional state, but the stimuli affecting one emotional state does not affect the other. One might find that some environmental stimuli, such as lighting, sound, or temperature, induce both pleasure and arousal level; however, these stimuli can influence
each level differently. For example, lighting influencing pleasure is associated with a minimum level of intensity that consumers are able to see in a store environment; otherwise, consumers may become uncomfortable. Lighting influencing arousal can be used as an attention creating medium, attracting consumers’ attention in a store environment.

**Pleasure**

Atmospheric dimensions affecting pleasure, defined here as a physiologically comfortable level, are ambient factors and physiological factors. Only the minimum required level is necessary to achieve pleasure. One feature of these two factors is relatively unnoticeable elements, perceived unconsciously. This phenomenon is strongly associated with human functions, and is associated with long-term exposure.

**Ambient factors**

Ambient factors are sensory stimuli that allow consumers to complete or continue their tasks (buying, window shopping, evaluating, or browsing) in a comfort level. These factors are required to meet certain levels for specific tasks. If they are lacking or exceeded, displeasure will be elicited. The ambient factors affecting pleasure are lighting, temperature, sound, and olfactory; these are measurable in determining comfort level.
**Ambient factors**
- Lighting
- Temperature
- Sound
- Odor

**Physiological factors**
- Anthropometrics
- Allocation of functional facilities (food, restroom)
- Territoriality (security)

**Sensory factors**

**Long-term factors**
- Architectural elements
- Color
- Materials
- People
- Goods
- Lighting
- Circulation (visual, tactile)

**Short-term factors**
- Lighting
- Temperature
- Sound
- Odor

**APPROACH**
- Liking
- Excitement
- Exploration
- Desire to stay longer
- Attractiveness

**PLEASURE**
- Comfort
- Relaxation
- Physiological desire

**MOOD**

**AROUSAL**

**Patronage Intention**

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Figure 5-2. Paradigm of Atmospheres-Emotion Relationship
Sometimes designers or store planners can use ambient factors as arousal inducing media for enhancing specific effects or experiences, such as simulation of harsh environments or themed environment. In those cases, acceptable tolerance when perceiving the ambient stimuli is necessary to maintain a comfort level. High or low levels of ambient factors, which are not acceptable over a long period, might be acceptable over a very short period. For example, cold or hot temperature changes that are unacceptable might be acceptable for very short periods; but if the changes exceed the acceptable period, displeasure will be elicited. Also, a small amount of quality change of ambient factors is also noticeable without complete consciousness. For instance, quality changes of ambient factors, such as lighting quality (warm vs. cool), temporal sound or music changes, or different scent usages, might evoke consumers' attention over a short period time, but soon those changes will get less noticeable, or unconscious.

**Physiological factors**

Physiological factors refer to functional factors that allow consumers to continue or complete their shopping tasks while maintaining a comfort level. These convey measurable anthropometrical factors, commonly known as human factors, such as allocations of functional facilities and territoriality.

These factors are associated with actual usage of space, and are usually not noticeable until consumers experience discomfort. Size of store fixtures, height of shelves, size of furniture, ramps, flooring material associated with safety, height of stair case steps, etc. are all related to anthropometrical factors. Functional facilities and territoriality are associated with store size,
anticipated number of consumers, and time spent. Food courts in a shopping mall, a coffee shop in a bookstore, or vending machines in a store, are examples of these factors (functional facilities) associated with time spending and size of the store.

Other departments such as service counters, cash wrap counters, and restrooms can be considered as physiological factors as well. These factors are important for completing shopping tasks and consumer satisfaction and for enhancing patronage intention. Therefore, departmental allocation should be considered as a factor affecting emotion, even though departmental allocation is strongly associated with shopping intention and cognition.

Territoriality is also an important consideration in enhancing pleasure. Width of aisles, privacy, social space, and security are considerable elements related to territoriality. Consumers need to feel safe and physically comfortable during their shopping; otherwise, displeasure will be elicited.

When physiological factors are applied in a store, user group consideration is important, if pleasure is to be enhanced. In other words, age, region, and physical disability of users should be considered. In most cases in designing a store, the new design has to meet certain safety codes; however, application of physiological factors can assume a more aggressive approach beyond the safety codes.

Arousal

Atmospheric dimensions affecting arousal are strongly associated with sense modality. Therefore, in this framework, environmental stimuli related to arousal are defined as sensory factors. Arousal requires a certain level of stimuli (threshold level) to evoke a consumer's aroused feeling.
Consumers may not detect slight changes of form, color, or temperature.

In determining sensory factors, time has a central role. As mentioned earlier, ambient factors, such as temperature, lighting, sound, and odor, can be used as arousal-evoking media. In this case, time that consumers are exposed to a situation is critical in controlling arousal level. Even slight changes of ambient factors can evoke arousal. The greater the ambient factor change, the shorter the time necessary to elicit arousal.

The other factors (other than ambient factors) are defined as long-term factors. Basically, these factors are related to visual and tactile factors. Visual factors are associated with architectural elements, colors, materials, people, goods, lighting, and visual circulation. Visual circulation is perceived spatial arrangement, both vertical and horizontal. For instance, location of staircase or escalators, and the arrangement of open and closed space can evoke arousal. Tactile factors are associated with actual body movements and tactile experience related to circulation and materials. People and goods are understood as visual resources in these factors. For instance, appearance of personnel or consumer or the number of people in an area might evoke consumers’ attention. Products being displayed in a store are understood as visual merchandising rather than part of a price related concept. Depending on location of goods or appearance of products, consumer arousal level might be evoked. Lighting is understood as an attention creating medium rather than ambient lighting. Spot lights, or theatrical lighting effects, might create visual attention so that the arousal level can be heightened.
These long-term factors are major elements in designing a store and are strongly associated with designers' artistic sense and creativity. In other words, composition of these factors can be varied in a situation by a store designer. Therefore, control of these environmental factors enhancing positive mood or approach behavior is critical, and this theoretical framework suggests it can be accomplished.

**Arousal Control Devices**

Arousal control devices are composed of both arousal-increasing devices and arousal-moderating devices. By integrating these two devices, a moderate arousal level, that is considered the most attractive situation, can be achieved. The taxonomy of control devices is based on three concepts: composition, experiential establishment, and readability. Compositional devices - complexity and coherence - are associated with comparative perception and pure sensory perception. Novelty and familiarity are the elements associated with established experience and expectation. Readability devices are ambiguity and legibility, which are associated with cognitive-emotion (table 5-1).

The concept of arousal control has significant meanings in store planning. First, it explains the relationship between artistic sensibility and induced emotional states. In the interior design field, focusing on commercial design, no framework has been found to explain creative activities in determining human behavior or consumer behavior. The proposed framework guides designers to create attractive store environments without distracting creative activities. The inverted U-shaped function of arousal in determining positive experiences in a store environment is key. In other words,
although designers create a different style of store, the induced emotional state can be the same. For example, induced emotional states in a complexly designed store or in a simply designed store might be the same. This notion is also supported by Berlyne’s aesthetic theory (1971).

Second, objective evaluation of proposed design and guidelines for decision-making in the design process are necessary. One could not ignore the fact that design evaluation, in terms of composition of environmental stimuli, is usually based on subjective interpretation. The inverted U-shaped arousal function and arousal control device theory might enable researchers, designers, or storeowners to evaluate or criticize a proposed store design more effectively and objectively. With the aid of these theories, certain arousal levels can be anticipated with clear application of arousal control devices.

Table 5-1. Arousal Control Devices

<table>
<thead>
<tr>
<th>Arousal Increasing Device</th>
<th>Arousal Moderating Device</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Complexity</strong></td>
<td><strong>Coherence</strong></td>
</tr>
<tr>
<td>- Variety</td>
<td>- Unity</td>
</tr>
<tr>
<td>- Instability</td>
<td>- Repetition</td>
</tr>
<tr>
<td>- Asymmetry</td>
<td>- Symmetry</td>
</tr>
<tr>
<td>- Contrast</td>
<td>- Balance</td>
</tr>
<tr>
<td><strong>Novelty</strong></td>
<td><strong>Familiarity</strong></td>
</tr>
<tr>
<td>- Surprise (scale size volume)</td>
<td>- Predictability</td>
</tr>
<tr>
<td><strong>Ambiguity</strong></td>
<td><strong>Legibility</strong></td>
</tr>
<tr>
<td>- Mystery</td>
<td>- Clarity</td>
</tr>
<tr>
<td></td>
<td>- Hierarchy</td>
</tr>
<tr>
<td></td>
<td>- Emphasis</td>
</tr>
<tr>
<td></td>
<td>- Meaningfulness</td>
</tr>
<tr>
<td></td>
<td>- Contrast</td>
</tr>
</tbody>
</table>
Arousal Increasing Devices

**Complexity**
Complexity refers to the number or variety of atmospheric dimensions involved at a time. Differing scales, sizes, or volumes can be utilized to heighten the level of complexity. Variety, instability, asymmetry, and the amount of contrasts are elements to increase complexity.

**Novelty**
Novelty can be enhanced when perceived stimuli are unexpected or new. This concept is associated with past experience. There are two concepts of novelty: absolute novelty, which is associated with completely new experience, and relative novelty, in which the stimuli might be familiar but are unexpected and surprising. Novelty tends to be decreased after being experienced. Therefore, flexibility and variety are necessary to maintain novelty.

**Ambiguity**
Ambiguity can be enhanced when stimuli have hidden or multiple meanings, and when the meaning is unclear. Ambiguity tends to evoke a feeling state of mystery, as Kaplan and Kaplan have described. Ambiguity can be associated with cognitive-emotion, representation, and abstraction.

Arousal Moderating Devices

**Coherence**
This device refers to unity, harmony, or balance in a composition of atmospheric dimensions, and is mainly associated with visual perception. Similarity, repetition, or symmetry can all be used to evoke coherence.
**Familiarity**

Familiarity is a degree of stimuli being repeatedly experienced by consumers. Expectation and predictability are components of this device. The familiarity device can be related to store image that is associated with shopping intention.

**Legibility**

Legibility refers to making sense of a situation or of information composed. Clarity, hierarchy, and emphasis are components of this device, and contrast can also enhance legibility; however, too much use of contrast can distract from legibility.

**Significance and Research Possibilities**

The significance of the proposed adaptive theoretical framework is that it brings new insight to the interior design field. Academic research on store design is relatively weak, and most research is done in business fields. Although one of the main goals of store design, from a designer’s standpoint, is to create attractive shopping environments, existing literature of store design guides is mainly focused on commodity. This framework integrates theories from three different fields: business, aesthetics, and environmental psychology. It suggests new research possibilities in determining relationships among emotional experiences, store environment, and creativity.

This theoretical framework also suggests that academic research in store design has great potential. First, store design is based on a homogeneous consumer group and therefore, human behavior associated with emotional experience can be generalized. Second, predictability is critical in
planning a store; therefore, academic research has a great potential to contribute to business practice. Finally, this framework provides possible independent and dependent variables for empirical studies.

This framework provides a starting point for evaluating creative works objectively by using the pleasure-arousal interaction theory. In design education or practice, design principles are used selectively in criticism, but no one should ignore the fact that composition of design elements is subjective, and its evaluation is also subjective. This framework might evoke fresh insight to develop a new evaluation tool in design critiques.

In this thesis, the author has attempted to understand the holistic picture of the relationship between environmental stimuli and emotional experience in store environments as an integrated study from a designer's standpoint. For a general understanding of the paradigm of emotional experience, detailed research might need to be investigated as follows: First, a determination of level of arousal is necessary. Second, depending on consumer groups, arousal levels may appear similar among a range of subjects, but could in fact be different; therefore, more investigation might be necessary. Third, studies of each "atmospherics" dimension can be conducted based on this framework. Finally, there are tremendous opportunities for empirical studies available to those who would choose to venture into uncharted areas.
In this chapter, the proposed framework is applied in designing a store as a case study. The Octagon Shop located in the downtown of Ames, Iowa is utilized. Most of the design process will be conducted based on the proposed framework. The purpose of this case study is first, to apply the framework as a guideline in the creation of a store design, and second, to analyze whether it enhances the design development in a design process for the further development of the framework.

The significance of this case study is that first, it provides a method of application in design communication for both designers and marketers. As noted earlier, the understanding of terms and concepts of design is somewhat different between marketers and designers. Interpretation of the terms “layout” and “ambient factors” might be just two of the examples. This case study provides designers with an opportunity to understand marketing aspects as well. In short, this study is a bridge between the business and design worlds.

Second, this case study provides marketers an opportunity to create a test tool in determining consumer behaviors within a store environment. The framework proposes clear relationships between environmental stimuli as independent variables and emotional states affecting human behaviors in a store; therefore, it is possible to form a test model.

Third, this case study shows how to control design vocabularies such as forms and other elements in the design practice for students and designers. Thus, they can effectively evaluate design analysis and decision-making.
Finally, demonstrating an application of the proposed framework in an actual design process helps to connect academia with the practical world. This contribution might be one of the most important roles in academia. Boyer (1990) supports this concept as stating "the scholarship of application". He also states that "new intellectual understandings can arise out of the very act of application" (Boyer, 1990, pg. 23). Therefore, this case study can contribute to further studies in the interior design field.

Background

**Historical Background**

The Octagon Center for the Arts was originally located in the Octagon House (figure 6-1) built in the 1870s. This house was used as its headquarters from 1966 to 1968 (Brown, 2000). Then the Octagon Center for the Arts relocated to its current site in the AM & AF Hall. The name “Octagon” has been retained.

The current building (figure 6-3) where the Octagon Center is now located was designed by the Des Moines architecture firm of Liebbe, Norurse and Rasmussen, and built in 1916; this building is also known as the Masonic Temple. The building is a common redbrick commercial building typical of early twentieth century (see figure 6-2), with the original exterior retained. Windows on the second and third floors are in their original conditions (Page, 1992).
Figure 6-1. The Octagon House, 1940 (Brown, 2000)

Figure 6-2. Masonic Building, 1919 (Brown, 2000)
The Octagon Shop

The Octagon shop (figure 6-3), 427 Douglas Avenue, is located on the southwest corner of Fifth Street and Douglas Avenue in downtown Ames. The store is an extension of The Octagon Center for the Arts, which is a community-based nonprofit art center emphasizing traditional and contemporary arts and crafts. The center hosts art exhibitions and juried art shows, provides art classes and workshops for all ages, and promotes special events. The gallery is located on the third floor, the office is on the second floor, and the studio for art classes is located below the Octagon Shop.

Figure 6-3. The Octagon Shop Located in the Downtown, Ames, Iowa
As a part of the Octagon Center for the Arts, the Octagon Shop offers midwestern arts and crafts for sale. Most items for sale are generated by local artists and a few items are manufactured. Merchandise consists of locally produced pottery, jewelry, stationery, fibers, wooden crafts, paints, books, CDs, glass art, and special art works from commissions and exhibits.

The total size of the Octagon Shop is approximately 1,794 square feet with 75 percent of the total space being utilized as the sale area. This area is approximately 1,357 square feet; the other 25 percent of the space is utilized for storage and a wrapping area. The store has two different floor levels: The upper level floor is 34-inches higher than the lower level floor, due to allocation of studio space underneath, in which art classes are offered by the Octagon Center for the Arts. The store has two accesses, one directly from Douglas Avenue and the other from the stair landing, which is 34-inches higher than the lower level floor. An elevator for physically disabled customers is located in the store and operates between the lower and upper levels.

**Interview**

The author interviewed the store manager. The number of employees, age of customers, problems of the space from a manager's standpoint, and organization of merchandise were discussed. The following is the selected information and input as stated by the manager.

**Number of employees:** Only one employee manages the store; for this reason, the counter space is utilized as an office space as well. The wrapping area is located in the storage area. The manager expressed a desire to integrate this function at the counter.
Customer range: There is no specific target group. According to the manager, the age group of most customers ranges between nineteen and fifty-four. Most customers tend to be visitors of the Art gallery.

Merchandising: Most merchandise is produced by local artists and some are manufactured. Basically, merchandise is displayed in a mixed format. Promotional merchandise such as for Mother's day, Christmas, or Valentine's Day is displayed in intended areas. Manufactured items are mainly postcards and miscellaneous items related to Iowa.

Problems: The control of temperature (summer\winter), existing lighting fixtures (they distract eyes), floor materials (wooden, and two different types of vinyl floor), no public rest room, and the wrapping area are identified as significant problems.

Manager's suggestions: Some customers like seeing the old radiator in the store, which has historical value. It might be good to have merchandise for children also.

Methodology

The major objective of this thesis is to create an adaptive framework as a guide for designers and marketers enabling them to effectively analyze a store environment, and to create a more effective environment to enhance good shopping experiences. The purpose of this case study is to attempt to utilize the proposed framework in design analysis and design development as an example of application.
The framework indicates that pleasure and arousal are the emotional dimensions determining emotional experience. Under the condition of pleasure level, intermediate arousal can maximize positive approach behaviors and positive emotional shopping experience. Therefore, design analysis and design development are based on these two dimensions.

Pleasure is determined by ambient factors and physiological factors. The pleasure is a precondition of enhancing positive shopping experience; therefore, achievement of pleasure is a requirement. As mentioned earlier, pleasure is associated with the concept of comfort.

In a pleasant situation, arousal is the key determinant of positive experience. Sensory factors are environmental dimensions for arousal. Six elements are proposed as control devices: complexity, novelty and ambiguity are hypothesized as arousal increasing devices, while coherence, familiarity and legibility are hypothesized as arousal moderating devices. In determining intermediate arousal level, selections of control devices are determined by the store designers or decision makers.

In this case study, the “black box” and “glass box” approaches will be indicated in the analysis and design development. The black box concept considers the designer as mystic. “In this the designer reviews the variety of inputs, but the design process takes place in a mysterious and secret way and out of the black box comes the design” (Arnold, 1986, pg. 94). It might be fair to say that intuition is an important part of design activities, and sometimes the design result might rely on the designer’s artistic sensibility. The thinking process of a designer for the black box approach, in fact, involves the deeper process of the glass box approach. However, the designer’s responses to environments, or design results by the designer, are rather immediate without formal analysis. The expression of the designer, in terms of the results of perceived stimuli and design, might be simply
“like or dislike”.

Selection of forms or materials can possibly be intuitive. Decision makers may not understand the rationale for the design, but that does not determine whether they do or not like the design. The black box approach is indeed important in the design process, and therefore, it should not be ignored. In this case study, the illustration (figure 6-4) of this concept will indicate when the black box approach takes place in the analysis and design process of the Octagon Shop.

The glass box concept is understood as a rational view of the design process. “It emphasizes the rational, evaluative, nature of decision making” (Arnold, 1986, pg. 94). The more the glass box approach, the more likelihood of a better design solution being developed. In the nature of the store design where predictability is critical, the glass box approach is critical in the decision-making process for designers, marketers, and storeowners. The framework proposed in this thesis is a glass box approach used as the design method to help designers and decision-makers to communicate effectively in evaluating design solution for decisions. In this case study, the illustration (figure 6-5) of this approach will indicate when rational thoughts take place.

Figure 6-4. Illustration of Black Box

Figure 6-5. Illustration of Glass Box
Design Analysis

Pleasure

Pleasure is defined in this framework as the feeling of physiological comfort. Ambient and physiological factors are hypothesized as atmospheric dimensions. Ambient factors are sensory stimuli such as lighting, temperature, sound, and odor; physiological factors are associated with functional factors affecting both customers and employees. The analysis of existing pleasure levels focuses on these two atmospheric dimensions. The figure 6-6 indicates the current layout of the Octagon Shop.

Ambient Factors

Lighting, temperature, and sound are current ambient factors in the store. Pendant lighting fixtures (figure 6-7) are the major source of lighting, though some spotlights (figure 6-8) are being utilized to illuminate some merchandise. There is also daylight through the windows aiding visibility. The store manager complains that the pendant lighting fixtures distract the eyes. The level of the ambient factor of lighting seems excessive, which could cause some consumers to feel uncomfortable.

The main entrance is located in the storefront and directly opens to the sidewalk of Douglas Street. Therefore, the control of interior air temperature can be a big issue during both summer and winter. The store utilizes the original radiators (figure 6-9) for heating throughout the store, while a modern air-cooling system is installed in the upper level.
There are no built-in speakers installed; however, music from a portable CD player in the counter area is used as a backdrop. The distribution of music is obstructed by the low partition between the lower level floor and the upper level floor. Therefore, built-in speakers are desirable for the customers in the store.

Figure 6-6. Current Store Layout
Figure 6-7. Pendant Lighting Fixtures

Figure 6-8. Spotlights

Figure 6-9. Radiator
Physiological Factors

Three factors can be considered as physiological factors for customers. First, there is no public restroom available in the store. Although one small restroom exists in the service area, it is narrow and deep and therefore not open to the public. Customers who want to use a restroom must utilize restrooms on the second or third floor.

Second, there is no direct access from the Octagon Center to the store for customers who are physically challenged. There is a door (figure 6-10) to the hallway, but it is thirty-four inches above the floor level in the hallway. Disabled customers must go outside and use the front door and then an elevator to get to the upper level. Other customers become confused about which direction to go to find the gallery space of the Octagon Center for the Arts. Should they choose the side door located on the landing of the hallway staircase or the store entrance from the hallway? The confusion lies in the location of the door and its appearance. Since the gallery is located on the third floor of the building, most visitors tend to use the elevator located in the hallway. To go to the gallery from the store, one has to either take the stairs down to hallway and then take the elevator up to the gallery, or take the stairs all the way up to the third floor. From the hallway there are no visual cues as to the existence or accessibility of the store.

Finally, the counter has no wrapping service. The employee uses the service room located behind the west wall display area on the upper level floor for this purpose. This situation may not be comfortable for either customer or employee. Security problems could also arise when the employee is in the wrapping area.
Since one person is managing the store, the effectiveness of task performance is critical. Traffic circulation of task performance is an important aspect of store design. Inventory control is another important part of store management. Storage (figure 6-11) in the Octagon Shop is located behind the south display wall on the upper level. However, the traffic line to the storage area is a long distance for the manager to walk from the counter in the store. Thus, there is no storage space for stock in the selling area. Since there is only one person taking care of customers and doing other in-store tasks, there should be stock space on the sale floor.

The cash counter is located in the center of the store on the upper level floor; this is a good location for a store managed by one person. However, the space between the counter and the elevator wall is too narrow for customers to move through when they are checking out. (Possibly the bottleneck phenomenon occurs frequently in this area.) The counter area is also utilized as an office.
space. But to control the entire store, the control devices, unfortunately, are spread throughout the space. First, the wrapping counter is located in the service area, and second, an electronic control panel is located beside the restroom. It would be helpful for the manager to have the control devices centralized near the counter area.

Figure 6-11. Storage (left), Service Area (right)

Arousal

In this framework, arousal has been defined as the feeling state that customers experience, and the degree to which the customers are aware of environmental stimuli. All the sensory stimuli are associated with arousal level. "Pure-arousal" and "cognitive-arousal" are introduced as the types of "perceived arousal". Pure-arousal is more immediate and is a result of direct sensory exposure. Cognitive-arousal is the result of pre-established cultural and personal experiences of a consumer. Six control devices, which are complexity, novelty, ambiguity, coherence, familiarity, and legibility have
been proposed as the criteria in determining arousal levels. The analysis of the arousal levels of the Octagon Shop will be conducted based on these criteria.

Facade and exterior

The façade (figure 6-12) of the Octagon Shop has rich and stately architectural characteristics. Visual balance of the proportion between the contemporary deep blue colored awnings and the architectural and historical characteristics is well established. In determining arousal level, it will be helpful to analyze the façade and the exterior in two different ways: pure-arousal and cognitive-arousal.

In analyzing pure-arousal, one positive aspect is evident in the different use of materials and geometric forms that enhance the complexity. Yet the composition of the stimuli is controlled by coherence and legibility. Repetition and symmetrical arrangements of the pilasters and the geometric form of windows are harmonious and, therefore, well balanced, or coherent. The strong color of awnings accentuates the storefront; therefore, clarity and visual cues at the entrance are well established or legible.

The negative aspects are: first, visual access of the interior space is poor. The glass of the windows is tinted with merchandise displayed on the windowsills. This disrupts the visual and information cues of the interior space, creating ambiguity. The visual characteristics (figure 6-14) of the Octagon Center for the Arts entrance are distinctive from the characteristics of the façade of the store. The image of a non-profit organization is an essential as a part of the Octagon Center, and this image is one of the strengths of the store. Therefore, more clear legibility should be employed.
Figure 6-12. The Façade of the Octagon Shop

Figure 6-13. The North Exterior
Second, typographies used on the exterior of the store are overwhelming (see figure 6-3, 6-13). The meaning of the message might be clear to consumers, but instability of visual composition increases the level of complexity and may decrease the level of ambiguity and coherence because of the strong instructional messages of the letters. Therefore, it seems that more careful application of lettering is necessary.

The store façade has cognitive arousal qualities due to the location of the store and the historical architectural characteristics. The store is located in a part of downtown Ames also known as the historical business district. Those familiar with the atmosphere of the downtown, the buildings, and the streetscapes experience feelings of nostalgia associated with pre-established experiences. The
individual pre-experience may be different, but evoking the memory may be strongly associated with the place. Also this familiarity and ambiguity of historical value might be relevant to the concept of the Octagon Center of the Arts because of its emphasis on local arts and crafts.

The visual association between the entrance of the Octagon Center (figure 6-14) and the store entrance (figure 6-12) is too weak to emphasize the relationship between the store and the Octagon Center. Obviously the name “Octagon” has a strong connection with the organization; however, the visual and architectural characteristics and separate access may not help this cognitive perception.

**Interior**

The overall impression created by the architectural elements (figure 6-15, 16) is that the interior character as a container of the merchandise does not positively support the pieces of arts and crafts. From a different perspective, the overall interior appears quite crowded. White wall color throughout the interior space plus strong contrast between the background and different types of merchandise cause the high complexity level. Grouping the merchandise could moderate the high level of complexity. The built-in wall display area in the upper level (figure 6-16) has the potential for such grouping. The niches can provide the opportunity. However, the fixed horizontal characteristics of wood shelves might disrupt the grouping.

Novelty could be achieved by providing flexibility in display. A promotional display for special occasions might create novelty, which requires comparative elements. Grouping merchandise visually might help to enhance the novelty as well. However, visual grouping and flexibility are limited by architectural elements.
The staircase in the store (figure 6-15) provides a bit of ambiguity or mystery in terms of visual cues of movement, due to its three-dimensional quality. Yet it seems that the staircase takes on a single functional role. Therefore, more three-dimensional elements might need to be introduced.

Some of the most noticeable sensory stimuli in the interior space are the types of floor materials used (figure 6-17). There are three different types of materials installed. On the lower level floor, vinyl tiles with a strong checker pattern are installed. At the upper level, three different types of checker patterned vinyl tiles, wood, and vinyl sheets are mixed (see figure 6-6). It is obvious that the installation of these materials was not related to the image of the store or the merchandise. This conflict not only increases the level of the complexity, but it also decreases the desired image of the merchandising quality, which is expected to be high in aesthetic.

The visual quality of merchandise as sensory stimuli is very high in complexity. Basically, the whole vertical space is utilized for display. Different types of merchandise, including art and craft works and manufactured merchandise, are randomly scattered around in a mixed manner. Obviously, there are certain themes for specific promotional areas, such as traditional folk arts or a Mother's Day promotion. Nevertheless, the architectural elements weaken the impact of groupings (i.e., lack of designated display area, and monotonous background).
Figure 6-15. Overall Scene of the Interior

Figure 6-16. Upper Display Area
In conclusion, the interior space needs to be fully revamped to enhance positive shopping experience. Other sensory stimuli such as music, smell, lighting, and architectural elements, should be reconsidered. The perceived arousal in the existing space seems not to be associated with cognitive arousal quality, but relies on merchandising itself. Therefore, cognitive arousal quality might be one of the major considerations for improvement.

On the other hand, pure sensory arousal qualities are recommended to improve the store façade and the exterior since cognitive arousal quality has been well established. Also, greater visual connection between the Octagon Center for the Arts and the Octagon Shop is recommended and needed.
Design Development

The organization of design development follows the proposed framework. The author expects that the proposed framework can guide a store designer in problem solving while enhancing his/her creativity. To help the readers understand the author’s thinking process, the illustrations of the black box and glass box approaches will indicate when they are to be applied.

A design process, however, is not strictly step-by-step although the main body of logic in a design process does exist. One cannot ignore the possibility that some solutions can be generated while a designer is accomplishing different or relevant tasks. For instance, while developing a traffic circulation pattern that is related to pleasure, the designer might find solutions to enhance arousal level. In this case, it might be more understandable if the findings are described in context. It is therefore possible to indicate other information along with this design development. Basically, the design development for the Octagon Shop is divided into two parts, pleasure and arousal.

Pleasure

In order to enhance the pleasure level, the following elements are required for consumer and employee.

For customers: 

- Access from the hallway for physically disabled customers
- Air temperature control
- Addition of accessible public restroom
- Centralized customer service – wrapping
- Updating of ambient lighting
For the employee:  

- Effective task traffic line  
- Centralized control of the store and customer services  
- On-floor stock storage

Figure 6-18 indicates the overall plan for enhancing the pleasure level. The red color indicates the traffic lines and the areas for customers. The new addition of the entrance is located in the left hand side of the store, and the previous main entrance is transformed to a window display area. The benefits of the new entrance are: first, the door provides the direct access from the hallway in the transit to the Octagon Center for the Arts, especially for those with physical disabilities; second, the air temperature in the store can be maintained at a comfortable level during severe weather conditions. Another benefit of sharing one main entrance to the store and the Octagon Center is that it provides visitors the image of the Octagon Shop as a part of the Octagon Center (Arousal). Furthermore, the distinctive characteristics of the main entrance to the art center (figure 6-14) will enhance the image of the exterior.

The bottleneck phenomenon occurs during busy hours on the pathway in front of the counter on the upper level floor. Instead of widening the pathway to accommodate multiple functions in the counter space, the cash register is relocated as indicated in the figure 6-18. This way, the pathway will not be blocked by customers who are waiting to checkout. To resolve this concern, the image of the cash-wrap counter should be emphasized (Arousal- Legibility). Broadening the width of the staircase might help to minimize the image of the narrowness of the pathway as well.
Figure 6-18. Plan for Pleasure
A new addition of an accessible restroom is proposed at its original location, providing an increase in the pleasure level. The transitional area between the restroom, service area, and sales-floor includes a water fountain for both consumers and the employee. It might increase the pleasure level if there were a rest area on the sales floor.

Incandescent halogen lights and indirect fluorescent lights as wall wash effects and as a backdrop for merchandising could be used for ambient light. In this way, the glare from the light sources can be reduced. The combination of the halogen lights and fluorescent lights can also provide a natural quality of lighting and good color rendition for the art works.

The green color (figure 6-18) indicates the traffic line and areas for the employee. The location of the counter for one person managing the entire store is critical and therefore maintained. There are several considerations in the design development for this area. First, all of the store area should be visually accessible from the counter. Also, the function of the office should be separated from the function of the cash-wrap counter. Moreover, the entire control device, regulating such factors as lighting and music, should be centralized in the counter area.

It is important for the task traffic line to be short. The access to the storage area is located for this purpose as indicated in the figure 6-18. The main electronic panel is relocated near the entrance. The entrance to the storage area is hidden from the sight of customers and remains open. The location of the service area, which includes a occupying kitchenette and a refrigerator, remains as it was, but separated from the transit area.
Finally, it is necessary to provide in-stock space on the sales floor. The in-store tasks can be reduced so that the only employee can serve customers more effectively and increase satisfaction. Another effect of providing the storage space on the sales floor is that the merchandising can be more attractively displayed; an overcrowded display reduces the image of high quality art works or those considered as beautiful art pieces (Arousal). Sets of base cabinets are proposed by the author for this purpose.

Arousal

There are two main considerations in designing a retail space to enhance the arousal level. First, overall arousal level of the entire space should be considered and should be moderate. In other words, one specific area is well designed and arousal is at an intermediate level; too many independently achieved arousal levels can cause too high a level of complexity. It is, therefore important that the holistic arousal level should remain as intermediate. Figure 6-19 indicates the overall arousal control for the entire store.

Second, incorporating novelty over a long term is critical in maintaining an intermediate level in a store. As indicated earlier, environmental stimuli affecting arousal are comparative. In other words, since consumers are exposed to environmental stimuli, they become familiar with the stimuli. A positive aspect of this familiarity is that it can enhance patronage intention. On the other hand, there is a possibility that people can lose interest in environmental stimuli. Therefore, some way to maintain an intermediate arousal level over a long term is necessary. Flexibility and control of ambient factors are applied for this purpose.
Figure 6-19. Plan for Arousal
The Arousal Landmark

The red color indicates arousal landmarks in the store. Tuan (1977) states that people perceive and remember their spatial experience by landmarks encountered. Thus, a series of arousal landmarks needs to be provided in spatial experience. The criteria in selecting the landmark in this project are: first, the landmark should be the place where customers visually encounter the stimuli. Second, the place should have the potential for enhancing three-dimensional feelings of ambiguity. Finally, if the place needs to draw the attention of customers so that they will be attracted to stop by, the arousal level should be heightened for the area.

The façade windows are the customer's first encounter and, therefore, should be considered as a landmark. Clear visual access is critical in enhancing legibility. However, the tinted glass and contrast of lighting intensity between interior and outside space distract the legibility. Enhanced lighting intensity could solve this problem. Clear visual accessibility at street level can enhance a three-dimensional feeling (ambiguity- mystery) for the interior space.

The awning-shaded window installed over the north side of the exterior is a visually direct encounter at the proposed store entrance. Novelty and legibility are applied for this area. Different geometrical configurations of architectural elements are introduced in this area to enhance the novelty. Background lighting effecting the display wall is utilized to enhance legibility. Nicely displayed artworks can deliver a clear image of the beauty of the art merchandise.

The second window from the east on the north wall has great visual accessibility from the north side of the street where The Ames Public library is located. The size of the window is big enough and has the potential to capture peoples' attention. Also, the staircase has a three dimensional visual
quality as well. This area should therefore be considered as an arousal landmark. The visual appeal of the staircase alone can enhance arousal.

On the upper level floor, two landmarks can be considered. One area is the visual merchandising area where customers visually and directly meet for the first time while approaching the upper level. An attractive visual display should be incorporated in this area. The possible arousal landmark is indicated in figure 6-19 in red color.

The last possible landmark is the end area of the store. This area should attract consumers to visit this section so the entire merchandise can be exposed to them; therefore, an intermediate arousal level should be achieved. Complexity, familiarity and legibility are applied in this area. Complexity is achieved by using variety, instability and contrast. A different merchandising group (a group of media merchandising), and a different visual resource (a demonstration of a movie), might increase variety and instability. Strong color contrast also increases the level of complexity. A set of couches can enhance the image of affiliation in this area; this can achieve strong familiarity. This area can be emphasized visually by color contrast and visual hierarchy. The visual characteristics of this area are similar to those of the counter area. A clear, functional legibility can be achieved in this way. The appearance of people as visual cues is utilized to enhance the level of legibility in this area as well.
Merchandise Display

Visual appeal of products is obviously a major consideration in store design. The overall perceived arousal level should be at an intermediate or moderate level. The existing arousal level of the merchandise displays at The Octagon Shop is analyzed as high, due to the uniqueness of the individual characteristics of merchandising. Nevertheless, the element of fun involved with the experience of exploring merchandise randomly scattered throughout the store should be maintained. Grouping (coherence) the merchandise might moderate the complexity level while maintaining this experience of exploration.

There are three different types of groupings applied to merchandise display in the Octagon Shop. First, four visually distinctive designated areas are introduced: a souvenir department, a children's department, a jewelry department, and a media department (blue color in figure 6-19). These four departments can enhance the levels of familiarity and legibility, thereby moderating the arousal level and enhancing the perception of variety.

Second, illuminated backgrounds are utilized in grouping merchandise (yellow color in figure 6-19). The unique appearance of an individual piece can be controlled and grouped by framing a set of items. The existing conditions of merchandising display could achieve this control of the grouping (see figure 6-16). However, the wooden colored horizontal shelving units make the possibility of grouping difficult. The ambient lighting in this area is utilized as an attention-creating medium. The background lighting color and intensity (yellow color in figure 6-19) can be changeable and dimmed. Changing the quality of ambient light (novelty) can maintain the intermediate arousal level over a long term. Light Emitting Diode (LED) light enables employees to control these effects (figure 6-20).
Figure 6-20. Merchandise Grouping

Figure 6-21. Window Display Unit
Finally, new additions of window display units are applied along the window side. The existing windows do not provide display space, so the merchandise is displayed on the windowsills. This distracts not only from the appearance of merchandising in the interior space, but it also blocks the visual access from the street level. Three-dimensional arts can be displayed in these units (figure 6-21).

Image of merchandise is an important consideration in store design. The merchandise in the Octagon store is considered high image in aesthetic; therefore, the concept of high image should be enhanced. The first impression customers get when they enter the store is critical to the image; therefore, the design of the lower level floor should emphasize this aspect of high image.

**Flexibility**

Flexibility is not only an important function of maintaining the intermediate arousal level, but it is also important in displaying merchandise: particularly, when it can support promotional display. For maintaining the intermediate arousal level over a long-term period, novelty is strongly associated with flexibility. The display on the lower level floor focuses on flexibility. The entire lower level floor is visually accessible from the outside and is the first encounter for customers. This area is mainly utilized as a visual merchandising area and gives maximum flexibility as one of its main goals.

The first encounter (indicated in red color in figure 6-19 next to the counter) on the upper level floor should be given flexibility as well. The display methods should be interchangeable to enhance the novelty over a long-term period; the display platforms in this area are totally exchangeable, and other display tables or props can be used in this area for display in the lower level.
Generally, most display units are fully adjustable for height to maximize flexibility for the functional purpose of merchandise display (figure 6-22). A Slatwall panel display system is utilized for the souvenir department, the children’s department, the wall area in front of the counter, and a freestanding display unit on the upper level floor (see figure 6-22, 6-28). This system can provide various display methods for different sizes of merchandise. A vertical wall slotting system is applied to the wall display area to allow the employee to adjust the height (figure 6-22). This system is installed in the general merchandising area (indicated in yellow color in figure 6-19) on the upper level floor. This system is also installed to the trim of the window borders where dark wood material is applied, so it is invisible (figure 6-21). The plain area where the vertical wall slotting system is installed is not recommended for display; however, the wall space can be utilized for special occasions, such as for special collections or special promotional events. The display units in front of windows are created by a customized bracket system (figure 6-21, 6-22). This area is designated for three-dimensional merchandise visible from both inside and outside. Lighting, installed at the top part
of the wooden borders, can enhance the visibility of merchandise and architectural characteristics from the street level. To enhance full visibility, glass shelves are applied in the window display area.

**Design Image**

The selection of materials, colors, forms, and composition of the design elements are the primary job of a designer. The elements can be derived from the designer’s artistic sensibility, from results of a design analysis, or from both. No doubt creativity takes a central role in the creation of design elements and design images. It is also important for a designer to know how to control the images and elements in the composition for a successful design solution.

The designer’s expressions of design elements and composition can be subjective, although the composition or design elements can also be the results of logical analysis. The perception by customers, in terms of the design concept, might also be subjective. There is a possibility that people might not like the design solution when a decision-making group likes the design. Good design, however, can share positive responses and perception by majorities even if the interpretation of the meaning is different by some individuals. This concept can help in understanding intermediate arousal level.

The author hopes the proposed framework will guide a designer to develop good design solutions while enhancing his/her creativity in interior design. The achievement of an intermediate arousal level by arousal control devices takes into account the composition of design elements and images for a successful design.
Figure 6-23. Arousal Control of Design Elements
The design motifs and images come from the exterior characteristics such as the façade window, the pediment of the window, and the pilasters (see figure 6-12, 6-23). These characters have good geometrical qualities and distinctive historical qualities. The author considers these characteristics as competitive elements.

The geometric quality of an octagonal form is applied in the new design. It is associated with the form of the original building in which the Octagon Center for the Arts originally occupied. This image might enhance ambiguity in the three-dimensional use of the form, legibility in the direct meaning of the form, and familiarity (figure 6-24).

Figure 6-24. The Use of Octagonal Form
Different qualities of lighting effects are also important considerations in this design development. Lighting has a strong impact on enhancing novelty. For instance, a theatrical lighting effect on the store façade can make the place a landmark because of the quality of novelty. To enhance positive emotional experience, people, as visual resources, and music are also considered in this design development. However, the composition of geometric elements with lighting, color, and materials is a major concern due to complexity of application.

**Complexity**

It is obvious that juxtaposition of different geometric forms and scale increase the level of complexity. The overall appearance of the space, however, is more simple and sophisticated. Coherence takes on a major role in reducing the complexity level. In the design of the Octagon Shop, tactile complexity might be more appropriate. Asymmetrical shopping traffic and vertical movement are applied to enhance the tactile complexity.

**Novelty**

Novelty is mainly applied in the landmark areas, as indicated earlier. Lighting effects are applied for the façade. Creation of a silhouette of architectural elements may evoke a moderate level of novelty with its forms familiar to customers. Instead of direct use of exterior characteristics, simple and detailed geometric forms are utilized while incorporating horizontal qualities of lines (the second image from the top in figure 6-23). This quality of novelty is applied in the window display area in the lower level, especially for the first window located in the north sidewall (figure 6-25). The large scale of the window pediment (the third image from the top in figure 6-23) is utilized...
for the counter, its ceiling, and the media department £1. Creation of different lighting quality by a LED lighting system is used to enhance perceived novelty ££.

Figure 6-25. An Example of the Application of Arousal Qualities
**Ambiguity**

There are two different considerations to enhance the quality of ambiguity. The first consideration is three-dimensional quality. The creation of three-dimensional visual access from the street level and three-dimensional architectural assemblages in the upper level are utilized to enhance ambiguity. Enlightening window display areas, installation of clear glass, and the wide-open window, which is the second window in the north sidewall, are all places to enhance the quality of ambiguity. Three-dimensional assemblage of the octagonal form and rectangular form in the upper level reflect this quality as well.

The second consideration is to create multiple meanings. For this purpose, direct use of exterior architectural forms is avoided. Introducing the architectural characteristics in a different manner might enhance multiple meanings (figure 6-25). The octagonal form might also enhance this quality due to its historical background. The use of the octagonal form is not directly applied rather customers might discover the form and the historical background (figure 6-24).

**Coherence**

Coherence in this project is a major factor in moderating the arousal level. Horizontal quality of lines and white color are applied to unify the design composition (see the fourth image from the top in figure 6-23). Horizontal quality on the upper level floor is achieved by the color contrast between ceiling color and white wall color in the octagonal formed area. Horizontal lines are introduced on the sidewall in front of the counter area and lower level area by using the Slatwall panel system. Repetition of forms and wood material is applied in moderating the arousal level as well.
**Familiarity**

The quality of familiarity is reflected in the use of forms and materials. The arch form of windows (figure 6-25) and the form of the pediment are utilized to enhance this quality. The uses of wood materials throughout the store might be considered for this quality, due to the traditional character and the common use in built environments.

**Legibility**

This quality is utilized in the creation of readability, particularly for visual functions in the store. For instance, the counter area has a distinctive color combination to draw customers checking out into the barrier-free area to prevent the bottleneck phenomenon in the pathway in front of the counter. The storefront where visual access is important to attract customers applies this quality of legibility. The replacement of clear glass windows and reinforcement of lighting intensity are applied to enhance this quality. Basically, the arousal landmarks (see figure 6-19) incorporate this quality. This quality is also important to create the high image of the store. The entire space of lower level floor in general emphasizes legibility to enhance the high image (figure 6-25).

**Design Result**

The design results for the Octagon Shop can be obtained by using the proposed adaptive framework. The existing store design is analyzed by using the framework as well. Existing pleasure and arousal levels are analyzed. For the pleasure level, developments of traffic circulation for customers and employee, air control, the addition of a public restroom, and security concerns are
recommended. For arousal level, complete renovation of interior space is recommended for the future.

The design process and decision-making are based on the evaluation of six arousal qualities: complexity, novelty, ambiguity, coherence, familiarity, and legibility.

The description of the design results focuses on comparative descriptions of the existing design juxtaposed with the proposed design. The organization of the design results is divided into four parts: overall design plan, façade design, lower level floor, and upper level floor designs. General descriptions of the proposed design are described in the overall design plan as well as the lighting plan. Existing images of the store are compared with the proposed design.

Floor Plan and Lighting Plan

Figure 6-26 indicates the proposed floor plan for the Octagon Shop. The new entrance door is relocated to the left side of the lower level floor. It provides a direct connection to the Octagon Center for the Arts by means of the hallway, and it provides efficiency of air control and store management. It also provides efficiency and more display space in the lower floor level.

A wooden floor is installed throughout the entire floor. The staircase is accentuated by using a different wood color from the floor color. The additional walls along the window side are expanded to provide display spaces; glass shelves are provided for visual access from the street level (see figure 6-29). The window display areas are highlighted by heightened intensity of lights to ensure the visibility from the outside.
Figure 6-26. Proposed Floor Plan
The lower level floor is designed basically as a visual display area. The current layout for the lower level floor provides temporary installation of the display showcases (they are indicated as rectangular forms above the capitalized letter, LOWER LEVEL in figure 6-26). For specials occasions, the flexibility in the lower level allows the store manager to sustain an enhanced arousal level for a long period of time. A designated area for the souvenir department is located on left hand side of the entrance. A Slatwall panel system provides flexibility for accommodating different sizes of merchandise (figure 6-22). The second window from the east located in the north sidewall remains open to provide clear visibility of the interior space from the street (figure 6-28). The visibility of the lower level floor is improved by adding an angle on the partition beside of the staircase.

The upper floor level is designed for general merchandising. The location of the counter is maintained at the existing location, with the entire space visually accessible from this location. The counter area incorporates office space and a wrapping area. The cash-wrap counter is located right behind the jewelry showcase to prevent the bottleneck phenomenon. The cash-wrap counter is designed for physically challenged customers to enhance their pleasure level. The children’s department is located within the existing side door area. The sidewall in this area is installed by the Slatwall panel system. The storage space is directly accessible from the counter area. The entrance to the storage is hidden from the traffic line to prevent any distractions from the shopping experience. The octagonal form and rectangular form are incorporated in a three-dimensional way to enhance the quality of ambiguity (figure 6-24, 27). The octagonal form is highlighted by the contrast between white background wall color and the wood color of the ceiling above the wall display area (the ceiling is omitted in the isometrics in order to highlight the merchandising space – figure 6-28, 29). The base
cabinets are provided within the octagonal area and the children’s department for on-site storage purposes. A rest area is created in front of the media department. Customers can watch a selected movie of Iowa artists or a video relevant to the merchandise and store image. The accessible public restroom is located near the rest area. The service room remains in its original location but is blocked by a wall from the intersection area between the proposed public restroom and the sales area.

The lighting plan (figure 6-27) for the interior space is composed of three different types of lighting sources: fluorescent, incandescent, and LED lighting system. The switches and controllers are centralized in the counter, area and the main electrical panel is located in the storage area. Fluorescent light is utilized for a wall wash effect as a backdrop. It is applied for the front window area, the drop ceilings in both lower and upper level to enhance color rendition, and part of the window display area (the first window on north sidewall). The fluorescent light fixtures are also used in the canopy area in the lower level store, where the souvenir and children’s departments are located.

Incandescent lighting fixtures are applied throughout the store; they are the major lighting sources illuminating the merchandise. They are also dimmable to enhance novelty and to create an attractive visual display of the merchandise. The dimmer switches are located within the counter area. The incandescent lighting system is utilized as an attention-creating medium for the window area to illuminate the wood trim area, which is visually accessible from the street level.

The LED lighting system (see figure 6-27, 28) is applied to the display area, where the octagonal form is applied in the upper level. It is used as a backdrop and to frame a group of merchandise. This lighting system allows the manager to adjust colors and intensity and to create dramatic display effects for promotional events. The system controller is also located within the counter area.
Figure 6-27. Reflected Ceiling Plan

Scale: 3/32" = 1'-0"
Electronic outlets are also important for effective merchandising display. Exposed wires might distract from positive shopping experiences and the store image. Therefore, the outlets are fully provided in each display. Two speakers are installed in the drop ceilings in both the upper and lower levels of the store.

Figure 6-28. North-east Isometric
Façade Design

As mentioned earlier, the existing façade (figure 6-30) has good visual and historical qualities as a storefront. The existing blue awning color also seems well harmonized with the historical characteristics of the façade. The proposed façade design (figure 6-31) attempts to maintain the original character, while improving visual accessibility using light intensity and replacement of clear glass. The large white letters on the north windows are eliminated, in keeping with the high image the
store seeks to project

The novelty is emphasized by dramatic lighting effects on the façade (figure 6-32). The inverted image of the architectural elements, highlighted by lighting, is designed for a strong impact on the façade’s landmark quality in downtown Ames. Customized exterior lighting fixtures should be carefully designed, so that, the direction of the light beam from the floor level highlights the silhouette and reflection of the awning color. These are the keys for the successful lighting effects proposed.

Figure 6-30. Existing Façade Design
Figure 6-31. Proposed Fa ade Design

Figure 6-32. Lighting Effect of the Proposed Fa ade Design
**Lower Level Floor**

The existing interior design was analyzed and several problems were identified. In association with the lower level floor, the partition located on the left hand side of the stairs blocks *visual* access from the counter (see figure 6-33). The proposed design (see figure 6-34, 6-36) solves this problem by cutting the partition at an angle. This angle also provides a nice three-dimensional view of the interior space, creating ambiguity.

Second, the existing lighting fixtures distract from the appearance of merchandise and the customers’ eyes. Incandescent lighting fixtures and indirect fluorescent lighting can be applied within the drop ceiling. Also, spotlights are applied above the windows to emphasize window merchandising and to enhance visibility from the street level.

Finally, a lower quality image of the merchandise currently is evoked, due to the high *complexity level* induced by the floor pattern and display methods (see figure 6-33). It seems obvious that the architectural surroundings do not support the high image of the merchandise. The total enhancement of an *intermediate arousal* level is necessary.

Simply refined architectural characteristics are created with the use of wood materials (familiarity, ambiguity, and coherence). For instance, *the arch form* is applied to the front window areas. Novelty and legibility are emphasized in the first window of the north wall (the right window in figure 6-34 and the left window in figure 6-36). The sophisticated tension between *vertical* and horizontal qualities can enhance a high quality image of artworks. The cut out display cases (the center in figure 6-36) located next to the center window, also enhance the image. The lower level floor basically provides maximum flexibility for maintaining novelty over a long-term period.
Figure 6-33. Existing Interior Design - Lower Level

Figure 6-34. Perspective View of the Proposed Design - Lower Level
Figure 6-35. Existing Interior Design View from the Counter

Figure 6-36. Perspective View of the Proposed Design from the Counter
The existing staircase is widened to improve three-dimensional visual access (ambiguity), and it also enhances the pleasure level (physical access) (figure 6-34). The existing window located at the right hand side of the staircase (figure 6-33) is identified as having the potential to provide three-dimensional visual access from the outside. The current arrangement however, is blocked by the window frame and merchandise. One piece of clear glass is proposed, and lighting intensity will support visibility from the street level (figure 6-34).

A designated souvenir department is introduced; the Slatwall panel system allows full flexibility for displaying merchandise (right hand side in figure 6-36). Fluorescent canopy lighting supports the visibility of this area.

**Upper Level Floor**

The problems of the existing upper level floor (figure 6-37, 6-40) are identified in the design analysis in terms of pleasure and arousal levels. For pleasure level, the task circulation for the employee and the storage space on the floor level should be reconsidered. A newly added drop ceiling and the use of indirect fluorescent lighting and incandescent lighting fixtures are proposed to resolve the glare problem identified. The existing access for the storage area (figure 6-37) is relocated near the counter (figure 6-41). The access to the storage does not distract shopping traffic, because of the diagonal quality of shopping traffic circulation. Base cabinets are proposed for the on-site storage function. The entire selling space in the upper level is visually accessible from the counter area so that one employee has control over the space.
Figure 6-37. Existing Interior Design of the Upper Level Floor Viewed from the Counter

Figure 6-38. Perspective View of the Proposed Upper Level Design from the Counter
(see figure 6-39 for the articulation of merchandise display)
As indicated earlier, a high complexity level of merchandise is identified on the upper level floor, as well as on the lower level (figure 6-37). The grouping (coherence) is identified as a solution to moderate the complexity level. The design analysis also indicates that hierarchy (legibility) of the quality of horizontal and vertical lines can also moderate the level of complexity. The octagonal form is applied to the wall display area (figure 6-38) and the horizontal quality is emphasized by using ceiling material (right hand side in figure 6-41). The grouping is accomplished by the indirect LED lighting effects. The LED lighting system is also proposed to maintain novelty over a long term.

The quality of three-dimensional ambiguity is applied to the octagonal space (figure 6-41). The existing rectangular quality (the top part of the existing wall where air grills are currently installed in figure 6-38) is maintained, and the display area is moved back into the octagonal form. This three-dimensional composition should enhance the sense of ambiguity.

The window frames in the upper level are emphasized with the incorporation of the coherence quality (repetition). Additional display shelves are proposed, and the merchandise can be grouped by the window frame as well. The spotlights are also installed on the frame to highlight merchandise.

Wooden material is applied to the cash-wrap counter to prevent the bottleneck phenomenon in front of the counter area (legibility) (figure 6-38). The differentiated scale of the window pediment image is applied to the display case of the cash-wrap counter and the media department (figure 6-38). Novelty and legibility are enhanced by the different qualities of forms and material.

The upper level floor is designed for general merchandising purposes. The existing merchandise quality plus the fun of exploration and discovery are emphasized in this area (figure 6-39). Merchandise unit systems, the vertical wall slotting system, the Slatwall panel system, and the
customized bracket system allow for flexibility in the display area. The merchandise space on the upper level is expanded in the octagonal formed area (figure 6-39), in the area of the existing side door where the children’s department is located, and in the window display area. This maximized display area can enhance the experience of exploration and discovery.

Figure 6-39. Merchandise Display – Upper Level
Figure 6-40. Existing View from the Back to the Counter - Upper Level

Figure 6-41. Perspective View of the Proposed Design from the Back - Upper Level
Result of the Case Study

The purpose of this case study is to apply the proposed framework in a design application. The design analysis and the design development are conducted based on the framework. Pleasure and arousal are hypothesized as the key determinants of emotional responses of subjects in a shopping environment. The concept of pleasure is associated with physiological comfort. In a pleasant situation, an intermediate arousal level is hypothesized as the most preferred level. Six arousal qualities are hypothesized in controlling environmental stimuli to enhance the intermediate arousal level in a store environment.

The proposed framework seems useful in design development for a store design. First, in the design analysis, the framework should be helpful in identifying unique strengths. For instance, the arousal qualities of ambiguity and familiarity are identified as current strengths of the Octagon Shop. The concept of ambiguity and novelty guided the author in manipulation of forms, colors, and materials.

Second, the framework could be useful in controlling design elements as a whole. The concept of intermediate arousal level was useful in balancing the individual design elements. Particularly, coherence and legibility show significance in the design development.

Third, the case study shows that the framework can be useful to enhance creativity in a design process. Particularly, ambiguity and novelty can challenge a designer to find creative solutions in advance. For instance, the case study revealed that applications of the three-dimensional quality of ambiguity, plus the novelty of lighting effects in the octagonal area and the façade, are challenging
for a designer. This case study also shows that the framework encourages a designer to consider all the possible environmental characteristics to enhance the emotional shopping experience of customers in a store environment.

Finally, novelty over a long-term period is shown as an important quality of arousal in store design. The concept of comparison in arousal takes a central role. Flexibility seems important in maintaining an intermediate arousal level, but sometimes, in the long run, it distracts from the total image of the store. The framework shows a potential to prevent the disadvantages of flexibility due to the six-arousal qualities, which are complexity, novelty, ambiguity, coherence, familiarity, and legibility.
CHAPTER 7. CONCLUSIONS

The goal of this thesis was to propose an adaptive theoretical framework that can explain the relationship between environmental stimuli and emotional response in a store environment. In this final chapter, the objectives and results will be summarized and evaluated. First, the overview of the research procedure will be summarized. Second, a summary of the proposed framework will be presented as a result of this thesis. Finally, the conclusion and implications for further research will be discussed.

This research has been conducted based on the notion that emotional experiences in a store environment are important for a brick and mortar store and can be primarily induced by atmospherics, based on following assumptions:

1. The emotional experience can be predictable in store environmental settings, and positive emotional responses are important for enhancing profits.
2. Environmental characteristics can induce and control certain emotional responses.
3. Although a design development is subjective, a framework exists, at least as a starting point to guide designers to create predictable space.
4. The M-R model is a promising theory for the research on environment-consumer behaviors.
This research was conducted as an integrated study based on grounded theories. Three main bodies of literature were reviewed. First, the importance of shopping experiences in relation to a physical environment was reviewed in environmental psychology and marketing. Second, grounded theories in environmental psychology were reviewed, based on the M-R theory, due to its primary use in business research in terms of environment-consumer behavior relations. Finally, a review of literature in the typology of environmental stimuli in business was conducted.

Integration and synthesis of grounded theories were attempted, based on critical analysis. First, a redefinition of terms was established, including emotion, cognition, pleasure, and arousal. Second, three grounded theories, the M-R model, Berlyne’s aesthetic theory, and the Kaplan and Kaplan theory, were analyzed and integrated in relation to environment-emotional human reactions. Finally, establishing typology of environmental stimuli was conducted, based on critical analysis of business literature from a designer’s point of view.

The adaptive theoretical framework was proposed in a single chapter. First, terms utilized in the framework were defined. Second, a paradigm of the framework in relation to environment-emotional human reaction was presented. Third, typology of the environmental stimuli and methods in controlling the environmental stimuli were established. Finally, significance and research possibilities of the framework were presented.
The proposed framework was applied in an actual design process as a case study. The Octagon Shop located in downtown Ames, Iowa was used. The design analysis and design development were conducted, based on the framework. The results were presented in comparisons between the existing design of the store and the proposed design.

**Summary of the Adaptive Theoretical Framework**

This framework integrates three different disciplines: marketing, environmental psychology, and interior design. Due to different uses of terms in each discipline, redefinition of terms is established. Atmospherics is defined as the controllable environmental characteristics conveying physical and nonphysical elements within a store, affecting approach-avoidance behaviors of both consumers and employees. Emotion is defined as the perceived feeling induced by atmospherics, including temporal feeling or cognitively induced feelings, termed cognitive-emotion. Cognitive is defined as the conscious thought referring to consumers’ perceived value-oriented appraisal in a store environment. Pleasure is redefined as the feeling state of physiological or mental comfort induced by atmospherics. Quality of pleasure is defined as bipolar, and its stimuli are unnoticeable unless they exceed a certain level. Arousal is defined as the feeling state that subjects’ experience and the degree to which these subjects are aware of environmental stimuli related to sensory experience.
Pleasure-arousal interaction is identified as the key concept in the determination of emotional response. Under the condition of pleasure, the inverted-U shape of function of arousal is identified. An intermediate arousal level is conceptualized as the level, which evokes maximum positive responses. Extremely low or high arousal levels should be avoided. Six arousal control devices (complexity, novelty, ambiguity, coherence, familiarity, and legibility) are introduced to achieve the intermediate arousal level desired.

Ambient factors (lighting, temperature, sound and smell) and physiological factors (anthropometrics, allocation of functional facilities, and territoriality) are hypothesized as the factors most affecting pleasure level. Sensory factors conceptualized as long-term factors and short-term factors are hypothesized as the factors affecting the arousal level. Long-term factors are conceptualized as containing high tolerance levels for respondents; they include architectural elements, color, materials, people, lighting, visual and tactile circulation. Short-term factors are associated with pleasure. Ambient factors fall into this category, and the tolerance level of the respondent is much lower than the tolerance level for long-term factors.

The results of pleasure-arousal interaction are elicited in a holistic way, and they affect the mood of customers; the mood stages induce approach behaviors such as liking, excitement, exploration, desire to stay longer, and attractiveness. These approach behaviors influence patronage intention of customers.
Conclusion and Implication

The case study conducted shows that the proposed framework has significant potential as a guideline for designers in the design process. It helped the author, not only to identify the strengths and weaknesses of the existing design in the analysis of the Octagon Shop, but it also helped him to control the design composition in advance. The framework shows potential as a decision-making tool in the design process. The creativity did not seem to be impaired by the use of the proposed framework.

In this thesis, the author tries to understand a holistic picture of an environment-human emotional relationship from a designer's standpoint. The proposed framework seems to adequately explain this holistic picture of human experience in a store environment. More detailed research might reinforce the proposed framework. Studies of a determination of arousal level, based on consumer groups and research on the specific function of each environmental factor, could feasibly be conducted.

This framework also shows that there is a great potential for further research in both interior design and marketing. First, as mentioned earlier, the framework proposes clear relationships between independent variables and dependent variables. The clear relationship between environmental stimuli and emotional responses is strongly suggested. Therefore, it provides an opportunity for marketers and design scholars alike to survey quantitative research on environment-human interaction. Second, the framework can be utilized for design education in development of creativity. Third, the effect of each arousal quality in relation to environmental stimuli can be further investigated. Finally, the
author is convinced that this study would bring a new insight to academia in the interior design field, and it can expand the interior research area significantly.
APPENDIX A. THE FRAMEWORK PARADIGM
Ambient factors
- Lighting
- Temperature
- Sound
- Odor

Physiological factors
- Anthropometrics
- Allocation of functional facilities (food, restroom)
- Territoriality (security)

Sensory factors

Long-term factors
- Architectural elements
- Color
- Materials
- People
- Goods
- Lighting
- Circulation (visual, tactile)

Short-term factors
- Lighting
- Temperature
- Sound
- Odor

Approach
- Liking
- Excitement
- Exploration
- Desire to stay longer
- Attractiveness

Mood
- Pleasure
  - Comfort
  - Relaxation
  - Physiological desire
- Arousal
  - Arousal Control device
  - Increasing devices
    - Complexity
    - Novelty
    - Ambiguity
  - Moderating devices
    - Coherence
    - Familiarity
    - Legibility

Patronage Intention
APPENDIX B. DRAWINGS OF THE OCTAGON SHOP
Figure 6-26. Proposed Floor Plan
Figure 6-27. Reflected Ceiling Plan
Figure 6-28. North-east Isometric
Figure 6-29. South-east Isometric
Figure 6-31. Proposed Fa ade Design

Figure 6-32. Lighting Effect of the Proposed Fa ade Design
Figure 6-34. Perspective View of the Proposed Design - Lower Level

Figure 6-36. Perspective View of the Proposed Design from the Counter
Figure 6-38. Perspective View of the Proposed Upper Level Design from the Counter

Figure 6-41. Perspective View of the Proposed Design from the Back - Upper Level
Figure 6-39. Merchandise Display – Upper Level
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